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OCTOBER, 1967

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ISSUE**

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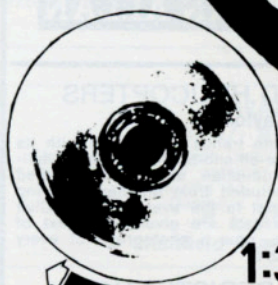
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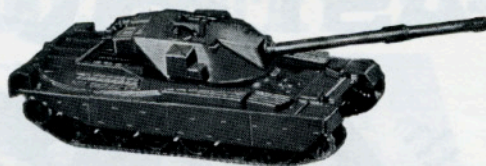
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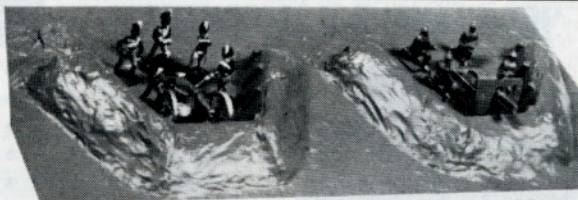
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AIRFIX magazine

AIRFIX

FOR PLASTIC MODELLERS

Volume 9, Number 2

magazine

October, 1967

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COVER PICTURE

Ideal subject for a 4 mm scale bus model is this handsome AEC Swift of Leeds City Transport. This 'Pay as you enter' vehicle has a radio-telephone link between driver and depot. Bus modelling article appears this month on page 50.

(Illustration courtesy AEC Ltd)

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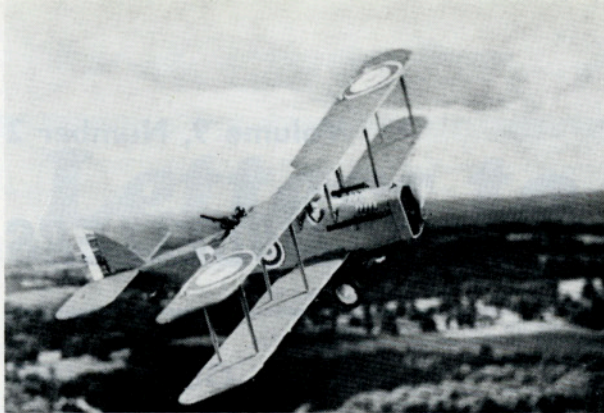
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Above: Airfix's latest World War I aircraft model, depicting the De Havilland DH4. **Right:** Another 1:72 scale naval aircraft kit, the Chance-Vought Kingfisher.

NEWS FROM AIRFIX

The world's greatest value in construction kits

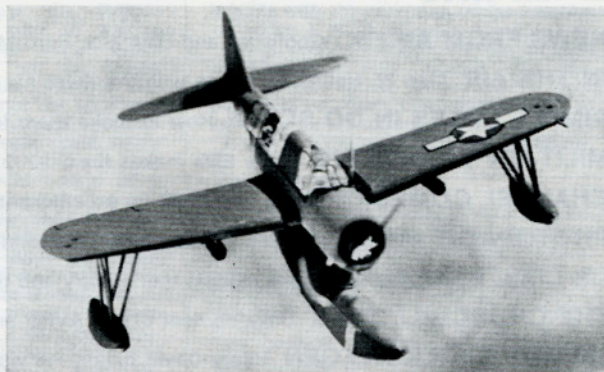
- De Havilland DH4
- Chance-Vought Kingfisher
- Ford Mustang Fastback car
- Porsche Carrera 6 slot car
- Ford J/Chaparral 2C slot cars

LATEST World War I aircraft kit to appear in the Airfix range is a fine replica of one of the most famous of all early fighting aircraft, the De Havilland DH4. Scaled to 1:72, the model is packed with the kind of fine detail for which Airfix is famous, including a realistic 'fabric' texture finish and ribbing representation. Tiny but accurate Lewis and Vickers guns are provided as armament and there is also a load of light bombs for dropping on the 'enemy' trenches. Pilot and gunner figures are provided, the latter having an authentic stool, rather than a seat, in his cockpit, and a detailed Scarf ring to take the Lewis gun.

Construction follows the procedure adopted with the recently introduced Airfix Spad, in that the struts are moulded in linked pairs which fit into slots in the upper wing and thus obviate much of the 'fiddling' that sometimes deters younger modellers from trying their hand with first world war aircraft kits. The components are moulded in khaki-green plastic and markings are provided for aircraft A7442 of No 25 Sqn, Royal Flying Corps, and the appropriate squadron markings are included on the matt transfer sheet.

The Airfix DH4 will be welcomed not only by aircraft fans, but also by military modellers who collect the Airfix OO/HO World War I soldier sets, since DH4s acted in close liaison with the army. Packed in the usual clear Polythene bag and complete with illustrated instruction sheet, the Airfix DH4 costs 2s 3d.

AIRFIX continue their programme of 'filling in the gaps' in the available range of naval aircraft models, with the release of an attractive kit of the famous Chance-Vought Kingfisher which served with both the US Navy and Royal Navy in the second world war. The Kingfisher is one of the most distinctive of all World War 2 aircraft with its long 'greenhouse' canopy and the floatplane configuration for



which it is best remembered, operating mainly as a spotter plane from the US Navy's cruisers and battleships or from Royal Navy armed merchant cruisers. The Airfix kit includes the long central float which made the Kingfisher instantly recognisable to spotters, and optional beaching wheels are provided to enable the completed model to take its place realistically on a shelf with other models if desired.

As an alternative to floats, a wheeled undercarriage is included in the kit to enable the modellers to complete the Kingfisher in its alternative landplane form, in which guise it operated from naval air stations and flying schools. Transfers are provided for both pre-war and wartime US Navy Kingfishers, and a detailed colour scheme drawing is included, very necessary in the case of the colourful pre-war finish. The Airfix Kingfisher comes boxed as a series 2 kit, complete with instruction sheet, for 3s 6d.

THE 1967 Ford Mustang Fastback is the latest American car to join the Airfix 'Elite' range of construction kits in 1:24 scale. Any one of four versions of this racy sports/touring car can be built from the superbly detailed kit.

The Mustang provided the American motoring public with their first home-grown 'small' car with big car comfort and performance. Sales far outstripped Ford's estimates and it became the forerunner of a new breed of car introduced by the Detroit car makers. The latest Fastback version can be supplied with either a standard 4.6-litre or a 7-litre V-8 engine.

A meticulously detailed seven-inch long miniature GT Road Racer, Drag Racer, Standard or Custom Mustang can be built from a selection of 150 precision polystyrene parts—60 of them chrome plated. Magnesium or stock wheels can be fitted with white wall tyres or drag racing slicks moulded in vinyl.

The cage roll-bar, bucket seats, exhaust pipes, carburetors, seat belts, red stop lights, transparent windows, steering wheel and instruments are just a few of the detail features of this big kit. Full assembly and painting instructions and a set of authentic transfers are included.

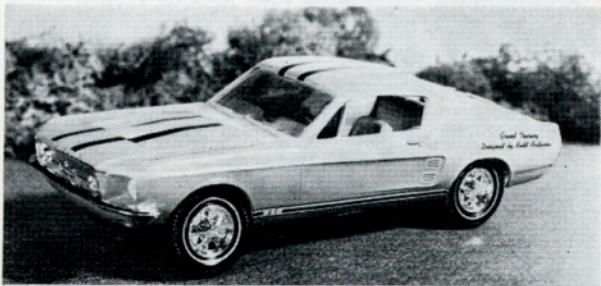
The Airfix 'Elite' Mustang is priced at 16s 6d.

IN addition to the two versions—standard ready-assembled and Clubman Special kit form—mentioned last month, the Porsche Carrera 6 is now released in the Airfix/MRRC Clubman Special assembled ready-to-race range. Most potent of all the Airfix Porsches, this model comes luxuriously boxed complete with attractive clear display case and stand, so that it makes a handsome showpiece when it is not performing on the track. The model is powered by the new MRRC ball race motor which features ball races for the back axle and bevel gears. In addition, it has Ackerman type steering and the standard—and very popular—MRRC nylon slot guide and pick-ups. Externally it resembles the lower price Airfix Porsches, except for the distinctive MRRC scale tyres complete with authentic treads and 'Dunlop Racing' insignia. Body is moulded in lightweight blue plastic—no painting is required—with details such as rear-view mirrors, filler caps, exhausts, and steering wheel brightly plated. There is a detailed interior with representation of the engine intakes and a scale driver figure. The price is 53s 3d complete.

MRRC point out that the powerful motor with which this model is fitted runs light at more than 30,000 rpm and that it is essential to disengage the gears when running up the motor at full voltage when the car is off the track, for example when it's under test.

IN our July issue we gave news of the 24 hour record success of the new Airfix/MRRC J Type Ford and this model, to 1:24 scale, has now been released together with a companion model, also to 1:24 scale, of a Chaparral Type 2C. These are top quality models to the standards by which MRRC has become a favourite among serious slot racing enthusiasts. Both have lightweight vacuum-formed bodies with enough resilience to take hard knocks without damage, and the moulding and finish is to concours standards. Power for each model is provided by a new twin-magnet ball race motor which has the back axle running in ball races and bevel gears. Ackerman type steering is fitted, plus the standard MRRC nylon slot guide and MRRC pick-up braids. Wheel hubs are light alloy, realistic representations of the patterns used on the actual cars, and wide sponge rear tyres are standard. A realistic driver figure is fitted in each model, and competition numbers and 'sponsor' transfers are carried

The latest 1:24 scale 'Elite' car kit depicts the Ford Mustang Fastback. With 150 parts the 16s 6d kit offers many optional finishes.



Airfix Products set-up this display at the recent 'Britain is Great' export-boosting exhibition at Selfridges store in London. The specially-built model bridge was a 24 foot-long replica of that carrying road traffic over the Firth of Forth and featured towers made from Airfix Betta Bilda snap-together building bricks and a deck made up from standard slot-racing track sections. The exhibit formed the centre-piece of a display of a wide range of other Airfix goods including many of their latest releases.

in prototype style. The J Type Ford is, of course, a closed car, but the Chaparral has an open cockpit, plated injection trumpets, and eight vertical exhaust stacks. It also has a roll-over bar and a hooded rear-view mirror.

Both cars are handsomely boxed in clear plastic display cases which can be used to show off the models when they are not racing. Price for these fine replicas of two of the best known 'big bangers' on the racing circuits, is very competitive at 68s 3d each, ready-to-race. Clear plastic bodies of the same two cars can be obtained as Airfix/MRRC accessories at 9s 5d each by enthusiasts who wish to utilise these in home-built models.

ARE YOU A KIT CONVERTER?

We have many letters from readers requesting back copies of AIRFIX MAGAZINE containing conversion articles. Back copies of some issues are still available for the benefit of readers who may have missed or mislaid earlier editions. For example, here are some of the practical articles which have appeared.

1965: September—Jeep conversions and Battle of Britain colour schemes. **1966: March**—Firefly Profile and Red Army equipment. **July**—RF-4C Phantom conversion. **August**—Catalina conversions. **September**—Matador variants. **November**—Sturm-tiger conversion. **December**—Me 262 conversions and half-tracks. **1967: March**—Household Cavalry conversions and AEC Y Type lorry. **May**—Crimean War and Do 217 conversions. **June**—Mosquito profile. **July**—Soviet missile tank.

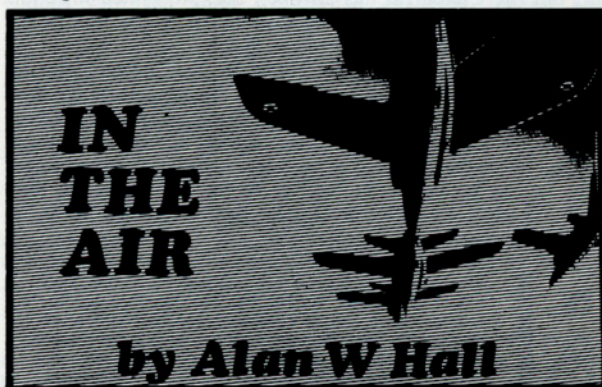
Would readers please note that all issues not listed above are now out of print and can no longer be supplied.

Back copies cost 2s each (including postage) for all copies up to and including September, 1966. From October, 1966, onwards the cost is 2s 6d an issue, post paid. Please address all requests for back copies, together with your remittance, to our circulation department at SURRIDGE DAWSON & CO (PRODUCTIONS) LTD, PUBLISHING DEPT, 26 ABERDOUR STREET, LONDON SE1.

BY the time you read this, HMS *Eagle* should be on her way to the Far East for another commission protecting British interests in that part of the world. Before the carrier, the Royal Navy's largest, finally left home waters she took on her air group and spent several weeks working up to full operational efficiency. I was able to see part of these trials, including the arrival of the first aircraft on board.

Arriving at Devonport dockyard on a very wet and overcast morning I joined big 'E' before she sailed. HMS *Ark Royal*, at present undergoing an extensive refit, was berthed close by and like *Eagle* will be capable of taking on board the first of the Navy's Phantoms when these become available in the not too distant future.

Leaving harbour was accompanied by the full ceremonial occasioned by this time honoured tradition. The Royal Marine band, naval guard of honour and the firing of a salute accompanied the slow and cautious route taken by the big ship as she negotiated, with the help of tugs, the narrows round Plymouth Hoe. Once out into Plymouth Sound and past the breakwater the ceremonial gave way to a flight deck full of aircraft handlers striking down the three Sea Vixens on board and preparing the ship to take on the helicopters from RNAS Culdrose.

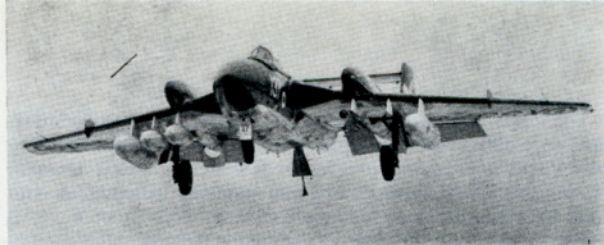


HMS *Eagle's* air group consists of three squadrons and a flight. The fixed-wing element, No 800 Squadron with Buccaneer 2s, No 899's Sea Vixens and the Gannet AEW3s from 849 Squadron could not be taken on board until the Wessex HAS1s of 820 Squadron had arrived to provide the essential plane-guard aircraft which is always present when fixed-wing aircraft are flying.

The helicopters arrived shortly after leaving Plymouth. The whole squadron flying in close formation weaved around the ship, their blue and yellow anti-submarine colour schemes merging with the grey of the English Channel as they went further away. Once on board, their rotors were folded and they disappeared below decks on one of the two lifts.

The carrier had to find some better weather before the rest of the air group could come aboard. Steaming at 25 knots she headed out from Plymouth until later in the afternoon, with clearing skies, the first Sea Vixens of 899 screamed low overhead and turned to make the first landings of fixed wing aircraft in the ship's new commission.

Eagle's aircraft were widely dispersed at shore stations throughout the country whilst the ship was undergoing her refit. The Buccaneers were at Lossiemouth, the Sea Vixens at Boscombe Down and the Gannets at Brawdy. To join all these together, provide suitable weather both at the departure point and over the carrier, and make sure that the ship was prepared to take them on board was a major opera-



Top: Hook trailing, a 899 Sqn Sea Vixen comes in over the round down to make a perfect touch-down. **Above:** *Eagle's* recent major refit has much altered her from her original appearance. Note the new steam catapult set in the angled deck, the prominent Type 984 '3-D' radar nacelle, and the enlarged island. Aircraft are parked forward in 'Fly One' to leave angled deck clear for next landing.

tion. Diversionsary airfields were set up at Brawdy and St Mawgan and were used by one or two aircraft which, for one reason or another, could not join the ship.

To photograph the arrival of the aircraft on board I took up a position behind the deck landing sight. It proved to be as close as I ever want to get to the sharp end of a jet aircraft as the wing tips passed close to my left ear accompanied by the most fearsome noise from the twin jets. The Deck Landing Officer told me later that several of the pilots from 899 had not done a live deck landing before, although they were fully proficient at doing the same thing on the simulated deck of a shore station.

Each pilot did several 'bolters' or touch and go landings before making a final touch-down. Deck landing practice has to be followed up religiously by naval pilots and, standing on the edge of the seemingly minute flight deck, the reason for this requirement became only too obvious. Although *Eagle* is over 800 feet long the landing area is just over half of this and Navy pilots have to be able to maintain a constant accuracy in their flying to be able to pick up one of the five deck arrestor wires stretched across

Below: Wessex HAS1 of 820 Squadron touches down.



the narrow confines of the stern.

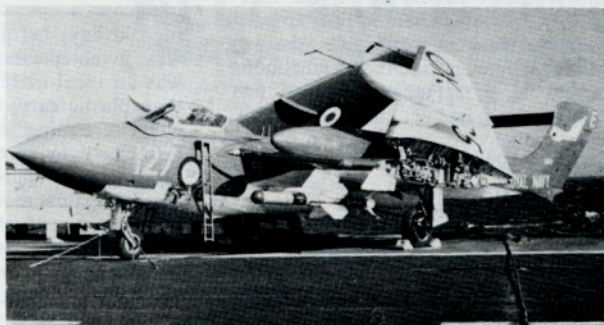
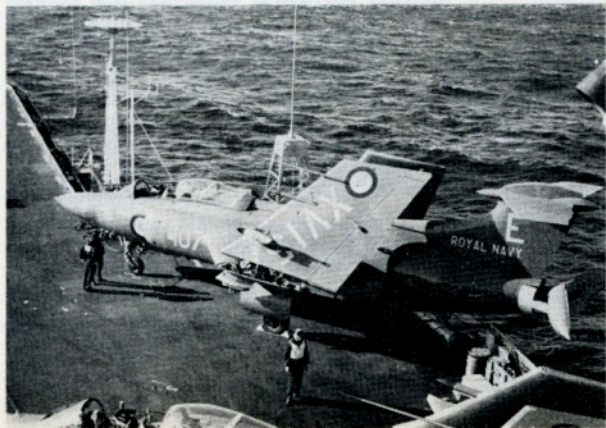
The flying programme on board a carrier starts early and ends late. Pilots think nothing of flying three or maybe four sorties a day. The first aircraft were launched at 07.00 on the following morning and this rate continued until late the same evening when the first night flying took place. A typical launch consisted of four Buccaneers, four Vixen, three Gannets, two Wessex on ASR duties and the plane-guard 'chopper' sitting close to the stern. In between all this the COD Gannet was dispatched to Brawdy with the day's mail and passengers. Aircraft took part in exercises which included air-to-air interceptions for the Vixens, bombing for the Buccaneers and anti-submarine and patrol work for the Gannets and Wessex. Both the Gannets and the Vixens left the immediate area but the Buccaneers stayed to bomb the splash target trailed from the stern of the ship with practice bombs.

The destroyer HMS *Aisne* accompanied *Eagle* for the whole time I was on board. Later in the day she came alongside to take on stores and then exercised 'tow forward' with the carrier. With a Force 4 wind blowing and a choppy sea this was no easy task and whilst the aviators had a rest the destroyer managed to take the carrier, which was twice its own size and several times its displacement in tow. I didn't envy the seamen on the smaller vessel in their task of handling wet lines in a sea which constantly washed the decks. To complete the exercise a fleet replenishment tanker came alongside and fuel was transferred.

When flying resumed I took a spare seat on the plane-guard Wessex and spent an hour watching and photographing the landings and take offs. During the launching operations the Wessex flies close to the ship's side to observe that each aircraft is hooked on to the catapult correctly. It is also in the right position should an aircraft have an engine failure and land in the sea. Similarly during landings the chopper hovers in the seven o'clock position to the carrier's course and the two crewmen watch the aircraft landing and report whether or not the hook is down. One of these two crewmen is a fully equipped and qualified diver. In the event of an aircraft ditching he would leap into the sea and attempt to release trapped aircrew under water.

The day was completed for me by watching the night flying operations from the carrier's talk-down radar station. The controllers marshalled the aircraft from about 20 miles out and a very close landing pattern was maintained. I was surprised at the speed at which aircraft could be recovered in darkness. There was little if any difference between day and night operations as far as this was concerned and the five controllers and two ratings who manned the radar dis-

Below: Buccaneer 2 of 800 Squadron parked forward of the island. Bofors mount and director, which were sited here when *Eagle* was built, have been removed to provide extra deck space.



Top: Yellow-vested director guides a Buccaneer on to the port catapult, sited in the angled deck. Note emblem of 820 Squadron on Wessex in foreground. **Above:** Fully-armed Vixen of 899 Squadron ranged on the flight deck ready for a sortie.

plays were obviously keen and efficient in their work.

After being with the Fleet Air Arm at sea, one is forced to re-echo the question, why are carriers being phased out of active operations in the mid-seventies? Each one of Britain's four carriers, *Ark Royal*, *Hermes*, *Victorious* and *Eagle* are in themselves neat and highly efficient little air forces capable of moving fast at the right time to prevent or quell the many minor conflicts that constantly seem to keep our forces fully occupied. Indonesia, Aden, the Israeli war, Hong Kong are but a few examples of what I mean. The RAF, equally efficient, but with fixed bases cannot hope to provide the same flexibility of operation as the FAA carriers can and yet there seems to be no way of getting the policy makers to see this. If Britain withdraws from Aden and the Far East there will be even more reasons why aircraft carriers should be retained. With what might be hostile nations in time of conflict, Britain will be entirely without any fixed base from which to operate. How could British aircraft reach the west coast of Africa for example without carriers?

Perhaps the fault lies with the Navy itself. By going for the single major carrier which was cancelled in the last Defence White Paper the planners may have signed their own death warrants as far as naval aviation using fixed winged aircraft is concerned. Perhaps a lesson could again be learned from the Israeli war where simple-to-operate types of aircraft licked a totally superior force which surrounded their country. Should not the answer be to go for small carriers using VTOL aircraft such as the Harrier or its derivatives? A smaller unit, costing less, without the addition of the superb computerised equipment now coming into service and operating the 'simple' type of aircraft in the VTOL role, is to my mind the answer.

Scratch-built buses in plastic card are easier than they look in 4 mm scale, if you choose a simple prototype like the AEC Swift/Merlin. This is a replica of the London Transport Red Arrow.



Bus models in 00 scale

DESPITE the seemingly endless flow of new die-cast miniature cars regularly appearing on the market, few manufacturers appear to consider the bus an attractive item to model. There is such a tremendous variety of prototypes, today no less than in the past, yet the 4 mm (OO) scale railway or roadway modeller has always had a very thin selection to choose from.

Luckily for the average modeller, buses are not terribly difficult to make in 4 mm scale as I hope to show. The railway modeller who requires the odd bus or two to stand in his station forecourt or the roadway enthusiast who wishes to make his traffic scene a little more representative can well take the initiative himself and do some home construction.

I am aware that in choosing to model the LT Red Arrow one-man single decker I have hardly selected a representative prototype. In service they are limited in their sphere of operation, as yet, to Central London and very few railway modellers are likely to have the forecourt of Victoria Station incorporated in their layout. However, the prototype is based on the AEC Merlin chassis and, apart from livery and detail modifications, the exterior is similar to many modern AEC Swift single deckers in operation throughout the country. A typical example of a Leeds City Transport AEC is shown on this month's cover. The Red Arrow bus was illustrated on the cover of our November, 1966, issue.

The basic construction material for the model is, as might be expected, plastic card. I used to use ordinary card from postcards or filing cards in

By Norman Simmons

the old days before the plastic variety was invented and in many ways it was an ideal material. It is less brittle than plastic card, bends easily and the effect of cutting with the craft knife is less likely to spread. It did however need several coats of shellac to preserve it against moisture and to seal it.

I now use 10 thou plastic card for the sides and ends of my models and these parts are made up as a sandwich, two identical pieces for each side or end with the glazing material held between them. I do not recommend using polystyrene cement when assembling these sandwiches as any surplus that may ooze out around the window frames will mar the glazing. It is better to use an impact adhesive such as Evo-stik or perhaps UHU but use it sparingly.

There is no doubt that the most tedious and time consuming job is cutting out the windows and I have found very few dodges to make this chore any easier. The most difficult models in my opinion are the ones with large radius curves at the corners of the window frames. I have tried drilling these corners first with a drill of appropriate size and joining up the corners with a craft knife but I have never had a great deal of success with this method. The hand drill I have used has all too easily wandered out of line and the windows are difficult to keep straight and level. I think I

Below: Simple box-like shape is apparent in this constructional view which shows the interior and basic roof structure.

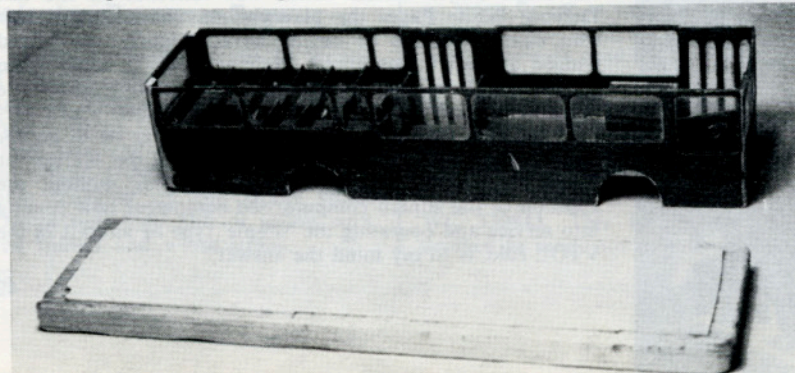
prefer to cut diagonally across the corners, leaving a small triangular fillet in the corner which can afterwards be rounded with a round or half-round needle file. After cutting out, the sides should be carefully inspected and the window frames cleaned up. Any frames that have been inadvertently cut through with the craft knife can easily be repaired with a dab of liquid cement—one positive advantage of using plastic card. Both the inside and outside should be painted before glazing.

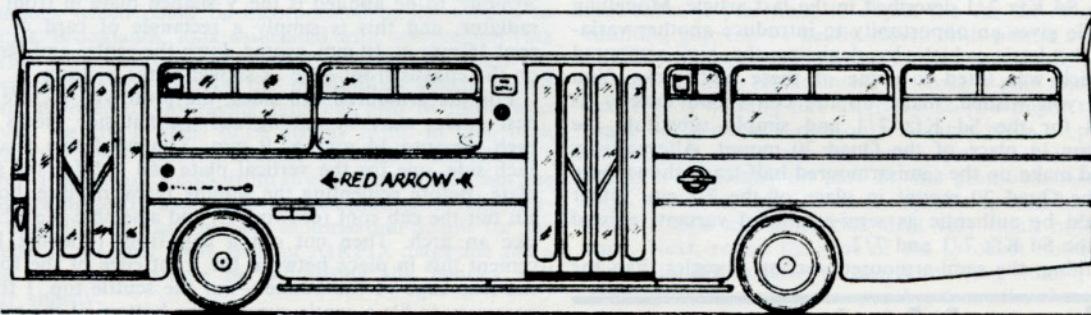
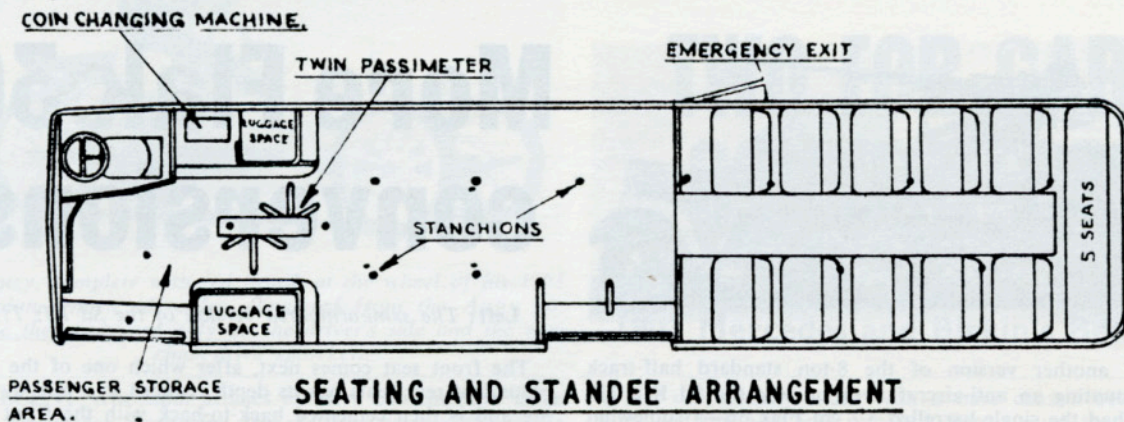
The offside on the Red Arrow model was made in one piece but because of the inset folding doors, the nearside was made up from four separate sections; the front folding doors, middle section, middle folding doors and rear section. Enough material was left either side of the middle doors and to the rear of the front doors to cement behind the main body panels. After completing the sandwiches for each section they were assembled, using the offside piece as a cross check against overall length and the position of the wheel arches.

The floor was cut from 30 thou card, allowance being made in the length and width for the thickness of the sides. Recesses 5 mm deep were cut for the front wheel arches and the front and centre steps. The rear wheel arches are 8 mm deep and both wheel arches are 14 mm wide. The Red Arrow bus is primarily a standee bus with capacity for 48 standing passengers and only 25 seated. All the seats are at the rear end behind the centre doors and in the prototype the floor at this part is raised one step to clear the rear mounted engine and raised chassis frame. In modelling this feature the main floor was kept level throughout the length of the bus and the raised floor was simply added to it, cemented on blocks made of strips of 60 thou card.

The rear corners were strengthened with strips of plastic card, enough not to be seen from the outside through the windows but sufficient to enable the rear corners to be rounded on the

AIRFIX magazine





outside with file and sandpaper. The sides below the floor can also be usefully strengthened with strips of 30 thou card. Normally inside model buses where seats are fitted, the seats help to strengthen the sides. A large part of the Red Arrow bus is devoid of seats and it is recommended that the inside of the sides at these points are strengthened with waist-height panels of 30 thou card.

At this point one has to consider what time one has available and what purpose the model is to serve. If time is limited and the model is required simply as a scenic accessory I see little point in going to great detail over the interior. On the other hand, if you are primarily a bus enthusiast and you are out to make an accurate model at all costs, then attention to the interior will be all important. Personally I fall into the former category, at least as far as 4 mm scale buses are concerned, and I keep the interior as simple as possible. Seating cannot be ignored but I draw the line at interior grab rails and handrails, for example. In the Red Arrow model I contented myself with partitioning off the driver's compartment, driver's seat and steering wheel (this was taken from an Airfix Matador kit), covers over the front wheels to represent the luggage spaces, waist-height partitions

Red Arrow drawings above are full-size (1:76 scale) for model. (Courtesy London Transport.)

either side the centre entrance and in front of the forward row of seats and of course the seats themselves. These were simple structures, mass-produced and built up out of plastic card—a flat seat and raked back mounted on 5 mm high strips of card. The whole interior was painted grey.

It will be noted in prototype photographs that the driver's half of the windscreen slopes backwards and is recessed at the top. I tackled this after assembling the body (but before fitting the roof) when the sides gave support to the otherwise fragile windscreen. The driver's windscreen was carefully cut at the sides and top, the clear plastic screen was bent back and small fillets of 10 thou plastic card were carefully cemented in place.

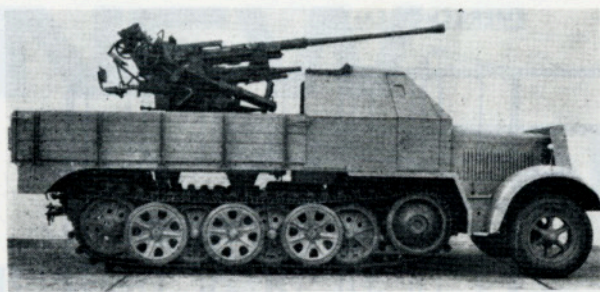
The roof is basically a piece of $\frac{1}{4}$ inch balsa to which a 'ceiling' of 20 or 30 thou plastic card has been glued. The 'ceiling' is nothing more than a flat piece of card cut accurately to fit just inside the top edges of the bodywork. The $\frac{1}{4}$ inch balsa should be cut oversize and the 'ceiling' glued to it. When near enough dry the roof can be cemented to the inside edges of the bodywork and the result will be a perfectly strong and rigid struc-

ture. The roof can then be carved to shape and finished with filler and sandpaper. Personally I find this the most satisfying and enjoyable operation of all.

The wheels are the last main feature to tackle. These can be adapted from Airfix military vehicle kits such as the AEC Matador and can be modified as I described in the October, 1966, issue. The Matador axles can also be used although you can do as we did in the old days and use Rawlplugs or tubes rolled up from gummed paper strip through which were inserted metal axles, the tubes being glued to the chassis or floor.

The model can be completed by adding such details as headlamps, number plates, exterior window ventilators, route destination blinds, etc, which can either be painted or made out of scraps of plastic card. Many readers may not be aware of a wide range of waterslide transfers specially produced for bus modellers by J. V. Short, 31 Pevensey Road, Eastbourne, Sussex. Not surprisingly there is nothing in the range to help with the Red Arrow model but he has a wide variety of fleetnames (I counted 40 companies in his current list), advertisements, destination blind names and numbers and a host of other items

Continued on page 53



More Flak 36 conversions

Left: The semi-armoured version of the Sd Kfz 7/2.

YET another version of the 8-ton standard half-track mounting an anti-aircraft weapon was the Sd Kfz 7/2 which had the single-barrelled 3.7 cm Flak 36—a somewhat similar weapon to the British Bofors—in place of the Quad 20 of the Sd Kfz 7/1 described in the last article. Modelling this vehicle gives an opportunity to introduce another variation on the basic vehicle by depicting the semi-armoured body which was fitted to some of these half-tracks. You could, if you wished, make up the conversion exactly as described for the Sd Kfz 7/1 and simply substitute the 3.7 cm gun in place of the Quad 20 mount. Alternatively you could make up the semi-armoured half-track shown here but fit the Quad 20 mount in place of the 3.7 cm. Either way would be authentic as semi-armoured variants existed of both the Sd Kfz 7/1 and 7/2.

If anything, the semi-armoured version is easier than the

The front seat comes next, after which one of the now-redundant rear seats has its depth reduced to 3 mm by sawing and is then cemented back-to-back with the front seat, thus providing seating for the gun crew. First piece of 'armour' to be applied is the V-shaped plate in front of the radiator, and this is simply a rectangle of card or plastic card 16 mm × 10 mm, scored down the centre and cemented on the chassis front edge as shown in the pictures.

For the armoured cab sides, the prototype picture is the best guide; start by cutting out the flat side pieces which each measure 14 mm × 9 mm. You need two pieces for each side, one for the vertical plate and one for the sloping plate. Before cementing the sloping faces in place, however, cut out the cab roof (drawing C) and assemble the whole lot like an arch. Then cut out a cab front (drawing B) and cement this in place between the front edge of the roof and the rear edge of the bonnet—not the scuttle top. I found it necessary to file a gentle curve in the bottom of the cab front so that it made a snug fit on the bonnet. There are two triangular faces on the corners of the cab front, which I've drawn all in one piece though it is easier to cut them out as separate parts and cement them in place after any necessary trimming.

Next fill in the scuttle sides with 8 mm × 3 mm strips of plastic card angled out to meet the vertical sides. The cab is completed by adding the doors; lower vertical faces are 8 mm × 6 mm and the shape for the upper, sloping, faces is given in drawing D. Though this all looks somewhat complicated, the work is not too difficult when tackled face-by-face in the order described. Final cab details are the vision covers in the cab front and doors, which are simply strips of plastic card to the sizes drawn. Rear end of the cab is open and the cut away section in the roof was usually, but not always, covered by a canvas sheet.

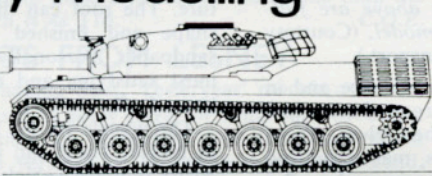
The truck type of body sides are very simply made from the parts provided in the Airfix Matador kit. Anyone who has done any conversions should have plenty of these left over. The sides are reduced in height to 8 mm by sawing or cutting a strip from the lower edge. Length is 38 mm, and I cut these sides such that the three innermost moulded uprights were central. Then I added an extra upright from a strip of card at the new outer edges. On one side, the access door detail has to be filed away and 'planking' scored into the section to remove evidence of the original door moulding. The rear face is the plain end from the Matador body, also reduced to 8 mm in height from the bottom. Because the sides are slightly longer than the original body floor, it is necessary to extend the rear edge with a strip of spare plastic or thick plastic card.

As in the Sd Fkz 7/1, the body sides were hinged to drop outwards when the vehicle went into action. In this model, I cemented the sides permanently in place, but I did briefly experiment with a Sellotape hinge—as described in last month's readers' letters for undercarriage doors—and found

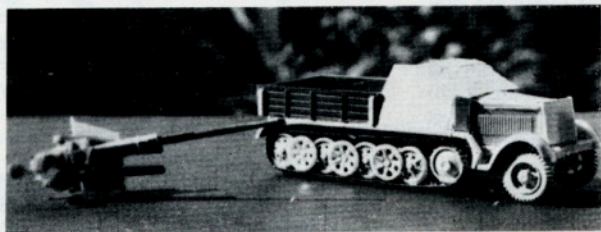
Military Modelling

by

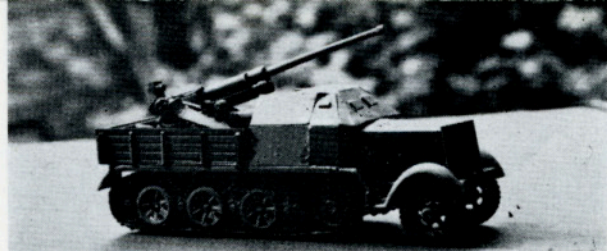
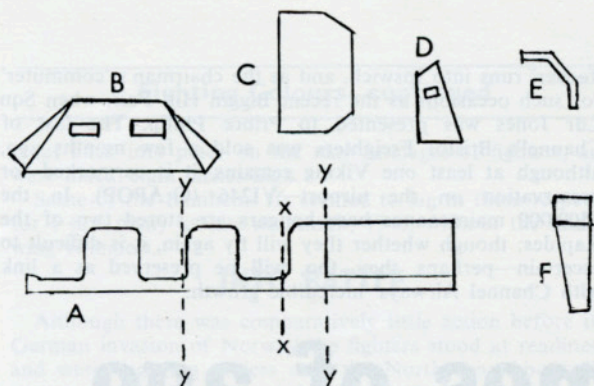
Chris Ellis



version with open framework sides, only the cab shape offering any real challenge to the less experienced modeller. Start by assembling the chassis as described in the kit instructions, but cut back the front curved section of the rear (long) mudguards for a distance of 3 mm along the horizontal surface. Reference to the prototype picture, and drawing E, will show the new angular shape which can be made up from plastic card strips cemented in place of the cut away plastic. Then fix the floor in place (part 46) but file away the two rear seat locating ribs before cementing. Front end is assembled in the normal way but the windscreen frame should be cut away entirely before the scuttle (part 56) is cemented in place.



The semi-armoured Sd Kfz 7/2 under construction showing body sides modified from the Matador kit, 3.7 cm AA gun modified from Flak 36 parts, and the armoured cab from plastic sheet.

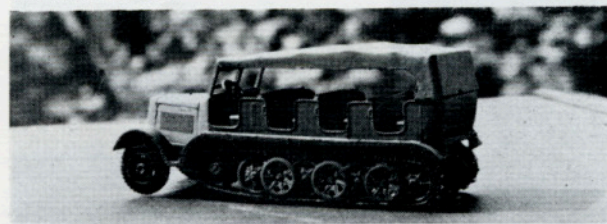
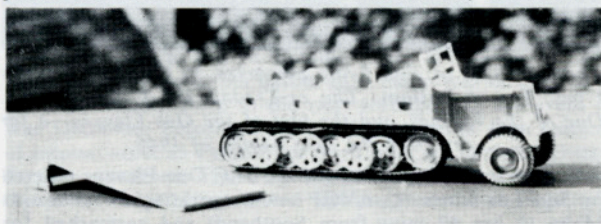


Above: Completed model of the Sd Kfz 7/2. **Left:** Full-size drawings for the conversion are keyed to references in text. **Bottom of page:** The Sd Kfz 6 troop carrier conversion. Note that card discs are inserted in front wheel hubs. Rear wheels are modified as described in text.

it feasible provided that hooks—eg, tiny loops of wire—were fitted to the rear corners to hold the sides together when they were closed.

Lastly we come to the gun which is considerably easier to scratch-build than the Quad 20. In fact, I 'cheated' by using the '88' components but as the shields (drawing F) hide most of the mounting it is quite convincing cheating. First slice 2 mm from the top of the pedestal on part 91 and cement it to the dead centre of the body floor. Trunnions and traversing block (parts 104, 105, and 106) are used straight from the kit, except that the narrow front ends of the two little cylinders are sawn off.

The '88' barrel is modified by cutting off everything forward of the wide collar round barrel and recuperator, and cutting off the recoil cylinder and loading tray. The remainder is assembled as in the instructions so that the mounting will traverse and elevate as the '88' does. The gun shields are fitted, one on each side and a seat is taken from the kit and cemented on the rear of the mounting where the loading tray once was. A handwheel from the kit is cemented on the sighting quadrant on the right side of the mounting and a 4 mm strip of plastic card is cemented upright on the same quadrant. For the gyro sight box, I cut a scrap of spare plastic and cemented it atop the gun adjacent to the sight arm (it should, in fact, be on the sight arm but if you do this the gun won't elevate). Lastly, the barrel is a 30 mm length of spare gun barrel—I used the 75 mm gun from the German armoured car kit with the muzzle brake cut down and the diameter slightly reduced by filing. Any other scrap plastic rod of suitable cross-section would do, however.



Bus Modelling—from page 51

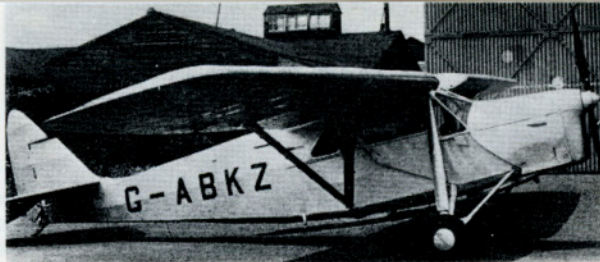
that will interest bus modellers, even those who just want to dress up Matchbox models. A stamp forwarded to Mr Short will supply a sample and a list of transfers which will I am sure surprise you. The quality of the transfers is excellent.

This completes the Red Arrow, the construction principles being the same for virtually all AEC chassis vehicles

of this type. If you need another 'operator' for your layout, suitable prototypes should not be difficult to find locally. Just take along your notebook and record how your chosen prototype differs in such details as front end treatment, windows, and doors from the Red Arrow. The Leeds City Transport Swift on the cover shows what I mean, but this has an

added challenge in the form of roof toplights. These, I suggest, would most easily be depicted by painting black rectangles in the appropriate positions.

Have readers any favourite bus they would like tackled in model form in future issues? Our choice is a Bristol Lodekka but let us know if you've any other preferences.



One of the ex-government Puss Moths forming the nucleus of the company of 21 years ago which became the Channel Airways of the 'sixties.

Channel comes of age

LESLIE HUNT SPOTLIGHTS 21 YEARS OF PROGRESS

LONG before he was released from the RAF in March, 1946, Sqn Ldr R. J. 'Jack' Jones (AFC for flying Battles and Hurricanes into balloon cables and towing off ballast-loaded gliders until the ropes snapped) decided that he would be his own boss. Buying three Puss Moths at a government sale he hangared them at Portsmouth, along with an Airspeed Courier and, on August 16, 1946, began flying commercially with passengers from a Herne Bay Holiday Camp, taking them over Canterbury and the Thames. As things improved he added a Miles Aerovan, in which Capt Hugo Parsons, AFC, one of his co-directors (still flying with Channel Airways) took a party of sons of RAF officers to Cyprus, to spend a holiday with their parents. Later he bought five de Havilland Rapides and pioneered air tours to Belgium. Then came the 1950s' freeze period which saw the closure of many small airlines, and a return to joyflying for Jack, his two co-directors temporarily returning to other occupations.

Weathering the depression—just—Jack Jones gradually built up his fleet to include Vikings (some ex-King's Flight, including King George VI's personal machine of the South African Tour). Then came the take-over of Tradair and their DC-3s, a DC-4, and the first Viscount. Later more Viscounts were purchased and recently a fleet of Viscount 812s acquired from USA, to supplement the Hawker Siddeley 748s and the remaining de Havilland Doves which are used for



Overseas air tours were started with the Miles Aerovan (top) and five Rapides, two of which remain in store.

'feeder' runs into Ipswich, and as the chairman's 'commuter' for such occasions as the recent Biggin Hill Fair, when Sqn Ldr Jones was presented to Prince Philip. The last of Channel's Bristol Freighters was sold a few months ago, although at least one Viking remains, it is earmarked for preservation on the airport—VI246 (G-APOP). In the £500,000 maintenance base hangars are stored two of the Rapides; though whether they will fly again, it is difficult to ascertain—perhaps, they, too, will be preserved as a link with Channel Airways' incredible growth.



Three decades of civil flying portrayed by Channel Airways types. Top to bottom: The ex-Tradair DC-4 and a DC-3. One of the Vikings, and the first of the One-Elevens—a far cry from the Puss Moths of 1946.

In June came the first of the six BAC One-Elevens ordered by Sqn Ldr Jones—G-AVGP—now operating as far out as Malta (2 hrs 40 mins from Southend) and earmarked for Britain's first 'Bus Stop' schedules to be started by Channel Airways this month, linking Portsmouth-Southend-East Midlands-Leeds-Bradford, Tees-Side, Newcastle, Edinburgh, and Aberdeen. As this is written, negotiations are in hand for purchase of three Boeing 707, 167 seaters for Far East and North American tours, and the current Air Transport Board licensing applications include one from the company to operate Comets from Stansted. Those who smiled when Sqn Ldr Jones announced his first order for the One-Eleven have had to change their views—they should visit his office where there is a Concorde picture—in Channel Airways golden-tail insignia!

photoPAGE

Pictures this month cover the wartime Middle East, Italy, and NW Europe. Captions by Michael J. F. Bowyer.

'Photopage' is a regular Airfix magazine feature, and further pictures will be published as available. We would be pleased to consider any contributions from readers, particularly of squadron aircraft or interesting colour schemes, and a free Airfix kit will be awarded for each picture used. Would intending contributors please note, however, that photographs submitted should be private copyright.

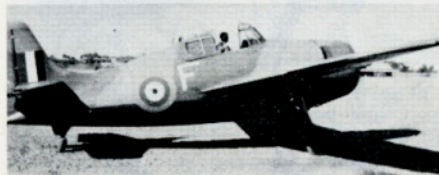
Owing to space limitations, it may be necessary to hold pictures for a few months before publication. To ensure safe return, please write your name and address on the back of each print. We cannot use press cuttings.



Above, top to bottom: Pictures from South African reader E. K. Venn show a rare view of Mosquito XIX MM669/G of 255 Sqn at Brindisi, Italy, 1945; Mustang III belongs to No 3 Sqn RAAF and was photographed at Fano, Italy, in 1944; Hurricane LD216/V-5 was used by the RAF and SAAF for training at Shollufa, Egypt, in 1944. **Pictures below, left:** Hudson (probably Mk VI) transport of 267 Sqn in the desert has the standard desert brown/blue camouflage and was sent in by Andrew Chappin. The Martlet was also pictured in the desert.

Above (right), top to bottom: Pictures from L. K. Evans show two Meteor IIIs of 616 Sqn with YQ-H nearest at

Luneburg on May 7, 1945. YQ-R is behind it. Mustang III 5J-X of 126 Sqn at Luneburg, also on May 7, 1945. It is in grey-green/grey camouflage. E. K. Venn sent the interesting view of Hurricanes flown by Yugoslavs under training at Shollufa, Egypt, in 1944. Nearest machine is LF452/L. **Below, centre:** Rare view of Liberator I AM922 of 511 Sqn (ex-1425 Flight) used on the Cairo run from Lyneham. Picture by Andrew Chappin. Roc target tug—like the Martlet—came from a reader who didn't enclose his name (claim please from the Editor). **Below, right:** Messerschmitt Bf 110 G9+GR, 180841 of NJG1 at Neumunster on June 6, 1945, is in light blue/grey mottle finish. Picture from L. K. Evans. EV757 is an Argus I in brown/blue desert finish. Picture from Andrew Chappin.





Regimental standard bearers are easily converted from Airfix Civil War figures. Above, left to right: Colour sergeants with USA national and regimental colours, the Confederate battle flag, and the Bonnie Blue flag.

US CIVIL WAR

Michael Blake models the infantry

THE American Civil War is understandably one of the most popular periods of all for wargamers and miniature soldier collectors, and Airfix caters particularly well for those who wish to reproduce this famous campaign on the tabletop. As well as the Union and Confederate infantry sets in OO/HO size, there are the artillery, US Cavalry, Wagon Train, and Cowboy sets which yield useful figures and equipment for conversions. In fact, anyone who has never before tried extending the basic range of Airfix figures could do no worse than make a start on the American Civil War as many of the alterations are exceedingly simple yet give a great deal of interesting variety to the original sets. As well as the familiar Blue and Grey, there were many other colourful and fascinating uniforms. 'Zouaves', 'Guards', 'Chasseurs' all had their distinctive styles, and can be reproduced using Airfix figures.

Infantry: Federal Regulars

I don't intend going into the Regulation issue—dark blue kepi and four-button coat, light blue trousers—in

detail. All accoutrements were black leather, including the kepi peak, and on the kepi crown the corps insignia was displayed. The canteen was grey. Airfix Union infantry back packs need slight conversion (this applies to all figures with back packs). The blanket roll on three sides of the knapsack should be trimmed off and a new blanket roll cut from sprue glued on top of the pack. The pack was black, the blanket roll red or light blue. For bayonets stick slivers of rigid plastic 5.5 mm long behind the haversack on the left hip. The scabbard was black with brass tip and handle fittings. All buckles, buttons and belt-plates were brass. NCOs had chevrons of light blue, and carried a short sword in place of the bayonet. The knapsack was often discarded and a rolled blanket (carried over the left shoulder) substituted. For this use a roll of plastic wood, suitably painted. Many regular units, like the Iron Brigade of the West, adopted the black slouch hat in place of the kepi. For these use Airfix Confederates painted as above.

Officers wore the double-breasted frockcoat with crimson sash beneath

the belt or a shortened single-breasted blouse, which can be made by trimming the Airfix officer's coat to just beneath the revolver holster. Both the kepi and the black slouch hat were worn. For the former, trim the Airfix figure's hat. In place of the corps badge a brass bugle device was worn at the front. Sword scabbard was black with fittings and tip of gilt. Shoulder bars were light blue edged in gold. A dark blue trouser stripe and off-white gloves complete the figure.

Another famous regiment, 1st US (Berdan's) Sharpshooters, wore European Green kepi, jacket and trousers, brown knapsack and light blue canteen.

Infantry: Militia

Militia uniforms varied. The 12th New York State Militia wore a 'Chasseur' style. These I converted from Union infantrymen, giving them gaiters by trimming, very carefully, the bottom 2 mm of each leg. The kepi was sky blue with dark blue band and white piping on the four seams. Tunic was dark blue with white piping all around collar, on cuffs and shoulder straps, down the front and along the bottom edge. Trousers were sky blue with white Austrian knots at sides. Gaiters were buff/yellow. Blanket roll and the insignia '12 NYSM' on the pack were white. Officers wore the same, with shoulder bars.

The 39th New York Volunteers were known as the Garibaldi Guard. These are obtained from Airfix Confederates given gaiters as described above. Both jacket and trousers were dark blue, with red cuffs, collar, piping round the bottom and down the outside trouser seam, and blanket roll. The hat had a green plume (cut from paper) and GG in brass at the front, and was black, as were the gaiters and boots.

Below: Uniform details for: (1) Duryea's Zouaves, (2) Union regular officer, (3) Union drummer boy, (4) 12th New York State Militia (USA), (5) Louisiana Tiger Rifles (CSA), (6) Texan regular (CSA), (7) Charleston Zouaves (CSA). Colours described in text.

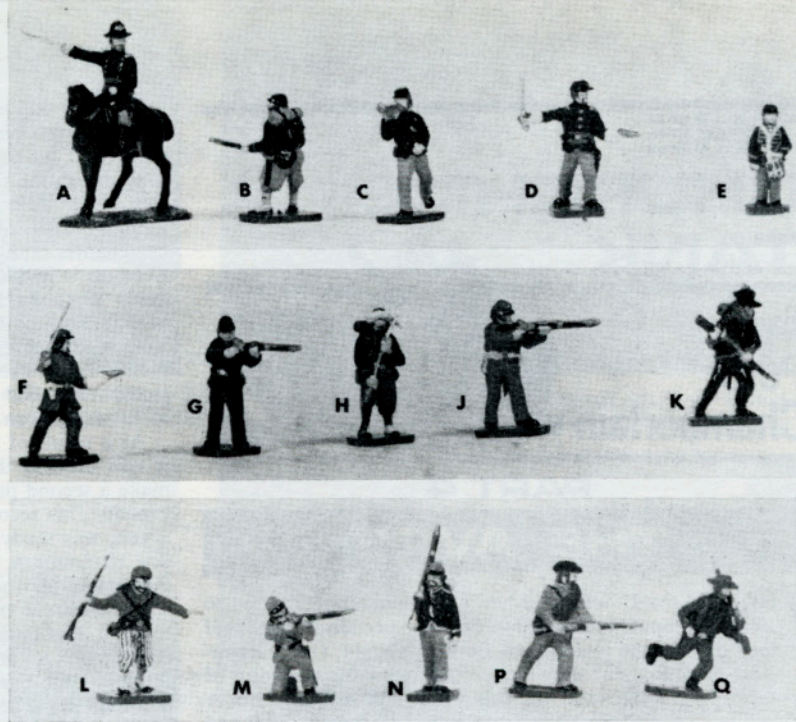


Zouave uniforms were based on French/Algerian regiments, and differed only in colours. Conversion is from the World War I French Infantry, the long greatcoat being trimmed down to represent full baggy trousers, and the collar removed. The Zouave jacket was collarless, open and short, only reaching the waist above a sash. Add blanket rolls to the existing packs and remove the lower back pack. Headgear varied; for the Zouave cap or fez, the existing helmet can be trimmed to shape. A turban was sometimes worn, and for this plastic wood is wound around the fez. Some units wore the kepi, and for these take the heads from the Union Infantry.

5th New York Volunteer Infantry (Duryea's Zouaves) wore a dark blue jacket and shirt. Jacket had red trim around the edge and on the cuffs, and piping on the face. Sash was red trimmed with light blue. Trousers were red and leggings brown above white gaiters; boots were black. The turban was white with a red fez, and yellow or blue tassel. Canteen and blanket roll were grey. 69th New York State Militia (Meaghers Zouaves) wore a dark blue kepi with brass '69' on the front. The jacket was edged in dark blue, and the cuffs were trimmed in red. Shirt and trousers were light blue, the shirt trimmed in red. Sash was sky blue, the gaiters buff, and the rolled greatcoat and canteen light grey.

Infantry: Confederate Regulars

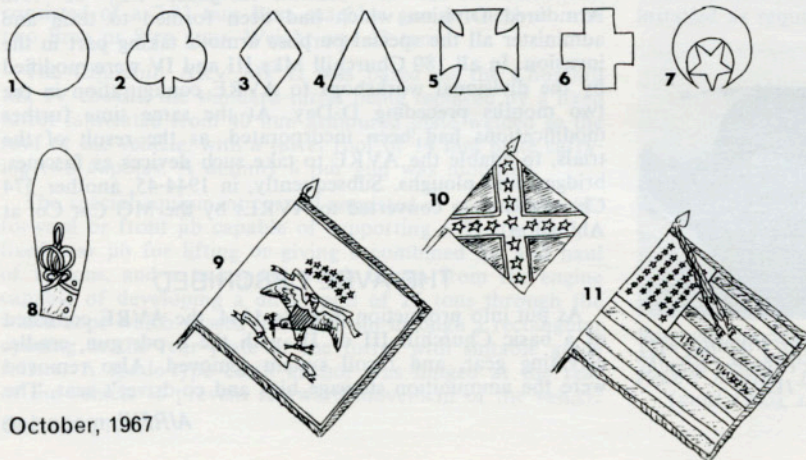
For men in regulation issue, use the Airfix Union troops, with light blue kepi and dark blue band, grey jacket with light blue collar and cuffs, and light or sky blue trousers. However, the vast majority of Rebel infantry wore the slouch hat, in colours from fawn to black, for which use the Airfix Confederates. The knapsack gave way to the blanket roll across the chest, and the uniform colour varied



Above: All these Union and Confederate infantrymen are converted from standard Airfix figures. (A) Regular officer. (B) 69th NY State Militia. (C) Union bugler. (D) Union officer. (E) Union drummer boy. (F) Confederate officer. (G) 1st US (Berdan's) Sharpshooters in green uniform. (H) Duryea's Zouave. (J) Charleston Zouave. (K) 39th NY Volunteers. (L) Louisiana Tigers. (M) Confederate regular. (N) 12th NY State Militia. (P) Confederate regular. (Q) Jackson's Foot Cavalry.

from brown through 'butternut' to many shades of grey. Figures from the Cowboys and Wagon Train add variety, those 'stepping it out' becoming Jackson's Foot Cavalry! Taking the running cowboy, remove the carbine in his left hand (save it for use with cavalry) and replace it with a rifle cut from a crawling Unionist,

Below: 1-7, USA Corps insignia badges for 1st to 7th Corps, worn on kepi crown. Divisional colours: 1st, red; 2nd, blue; 3rd, white. (8) Confederate officer's sleeve—lieutenant. (9) USA National flag. (10) CSA Battle flag. (11) USA regimental colours.



cemented with the barrel over the left shoulder and held in the left hand. Texan units wore a silver star (Lone Star) on the hat. Trousers were often tucked into socks and this feature can be depicted by trimming the ankles as for gaiters.

Officers wore the frockcoat with a crimson sash, or a blouse, and field officers wore the kepi rather than the slouch hat. The kepi had gold piping on the crown and four seams. 'Chicken-guts' on the sleeve and insignia on the collar, both in gold, denoted rank. A navy blue stripe ran down the trouser seam.

Infantry: Militia

Charleston Zouaves wore a typical volunteer militia uniform of grey jacket and trousers with white belt, cross-belt and canteen strap. Kepi, collar, shoulder straps, cuffs and a broad stripe down outside trouser seam were red. On the kepi crown was the state Palmetto Tree emblem.

Louisiana Tiger Rifles wore a Zouave outfit. Baggy trousers were made from bed ticking, ie, were white with thin blue stripes and the short jacket was drab olive brown, with red trim. Shirt and cap were red, the cap with blue tassel. Gaiters were white.

Continued on page 72

THE CHURCHILL TANK

by
Peter
Chamberlain



PART 4

THE AVRE

THOUGH the Dieppe raid had been unsuccessful, it led to the development of many of the specialised types of armour used in the invasion of Europe in 1944. One particular item of equipment shown to be wanted was some form of protection for the assault engineers who had sustained heavy casualties under fire while trying to breach the sea wall and other obstacles on the Dieppe beaches. In August, 1942, when the lessons of Dieppe were being evaluated, Lieut J. H. Donovan of the Royal Canadian Engineers proposed a scheme for converting a tank into an armoured vehicle for the use of engineers. It was felt that engineer personnel operating in conjunction with armoured formations should be provided with armour to protect and carry their stores. Comparative trials carried out with Shermans and Rams showed the value of the Ram's side doors for easy access to and exit from the vehicle under fire.

However, the Ram lacked stowage space, and the Churchill was considered a more suitable vehicle for the purpose. Its side (or pannier) doors were also at a more convenient height for access and the vehicle offered superior armour protection over the Ram or Sherman. In October, 1942, orders were given to the 1st Canadian ME Coy to carry out a full conversion on an old 2 pdr-armed Churchill incorporating all of Donovan's proposals. All ammunition bins were removed as well as the co-driver's seat, the turret basket and the main armament. New stowage compartments were fitted to take up to 36 cubic feet of engineers' stores—demolition gear and

tools, etc.—and a mock-up of a spigot mortar, then under development, was fitted in the turret. This prototype was completed by December, 1942.

Work on the actual spigot mortar prototype which was to arm this vehicle was commenced in September, 1942. A preliminary experimental model was mounted and tested in a Covenant tank and, as this proved successful, arrangements were made in November, 1942, for the construction of three more weapons for installation in the Churchill engineer vehicle. So modified, the vehicle was known as an Armoured Vehicle Royal Engineers, AVRE for short. The new mortar was called a Petard and the bomb which this weapon projected was called a 'Flying Dustbin'. The Petard was designed to fit straight on to the 2 pdr gun mantlet of the Churchill.

As a result of the inspection of the first AVRE prototype it was decided that the 1st ME Coy should go ahead and make a second prototype, this time converting a 6 pdr-armed vehicle. This second prototype, slightly modified and without a gun, was ready by February, 1943, trials being carried out late that month. On this occasion the first AVRE fired its Petard mortar for the first time and successfully demolished some concrete obstacles with the 'Flying Dustbin' bomb. Since it was desirable to convert Churchill IIIs and IVs as operational AVREs, it was decided to modify the Petard for fitting to the 6 pdr mantlet. Trials continued through 1943 and the Petard design was finalised in March, and the AVRE in December, respectively, and approved for production.

Early in 1944 it was decided to form and equip three RE regiments as armoured assault regiments for participation in



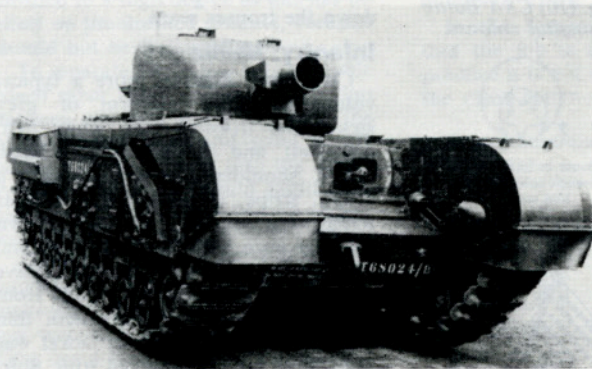
An AVRE of 1st Canadian Army moves into action at Nijmegen in 1945. This vehicle has the fittings to take CIRD, ploughs, and SBG bridge.

Operation Overlord, the Normandy landings. These regiments were equipped with the first AVREs to be produced and formed the 1st Assault Brigade, RE, of 79th Armoured Division which had been formed to train and administer all the special purpose armour taking part in the invasion. In all 180 Churchill Mk III and IV were modified by the divisional workshops to AVRE configuration in the two months preceding D-Day. At the same time further modifications had been incorporated, as the result of the trials, to enable the AVRE to take such devices as fascines, bridges, and ploughs. Subsequently, in 1944-45, another 574 Churchills were converted to AVREs by the MG Car Co. at Abingdon.

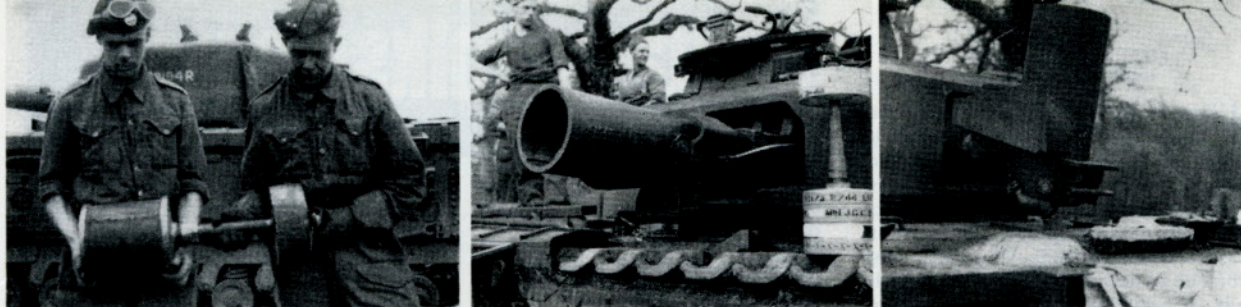
THE AVRE DESCRIBED

As put into production in early 1944, the AVRE consisted of a basic Churchill III or IV with the 6 pdr gun, cradle, elevating gear, and recoil system removed. Also removed were the ammunition stowage bins and co-driver's seat. The

AIRFIX magazine



One of the early Churchill AVREs used for training with Petard mortar but no fittings on the hull for engineer attachments. This is a converted Mk IV.



Above, from left : Detail views of the AVRE and its armament showing a close-up of the 'Flying Dustbin', the Petard on the 6 pdr mantlet, and the method of loading through the front hatch. (All photos Imperial War Museum.)

flaps of the co-driver's hatch were welded up and an aperture 13 inches \times 12½ inches was cut out immediately above the co-driver's position and fitted with a sliding flap. To load the Petard, the turret was traversed to bring the weapon above this aperture, whereupon the co-driver pushed the flap forward and passed a 'Flying Dustbin' up into the loading trough of the Petard. Compartments for holding the 'Flying Dustbins', each of about 9 cubic feet capacity, were formed in the side panniers fore and aft of the nearside escape door and aft of the offside door.

Other equipment carried included electric cable which could be connected to the tank battery for firing the Wade charges, and various types of associated demolition charge. The Petard was bolted direct to the 6 pdr mantlet and fitted with a screw elevating gear suspended from gimbals on a bracket welded to the turret roof. The lower splash plate was modified to accommodate the Petard while the upper splash plate was completely redesigned. Fitments were added to the hull

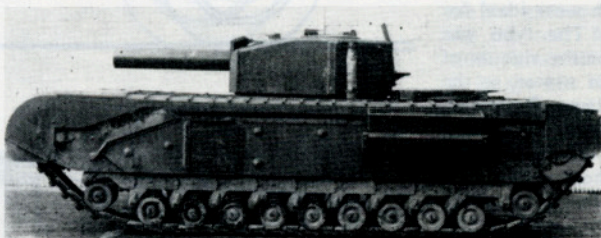
on a 6 pdr field carriage. The second Ardeer prototype was mounted on a Churchill III in 1944. It weighed 9 cwt and had a length of 10 ft. The projectile weighed 54 lb and the sand-filled dummy counter-projectile weighed 48 lb. Range was 450 yards and the rate of fire about three rounds in two minutes. Development of this interesting weapon was stopped as it was found to be impractical under action conditions.

Woodpecker : This was another experimental version of the AVRE evolved during 1944 for the demolition of concrete fortifications, and consisted of 'Flying Dustbins' with rocket attachments mounted four each side of the vehicle. They could be fired in salvo or as single shots.

ARMoured RECOVERY VEHICLES

Production of a recovery vehicle, the Churchill ARV Mk I was begun in February, 1942, the basic vehicle being a Churchill II with the turret and armament removed. A portable jib crane with a lifting capacity of five tons was

Continued on page 63



Above : The Ardeer Aggie. **Right, top and bottom :** The Churchill ARV I and ARV II, both with jibs rigged for working.

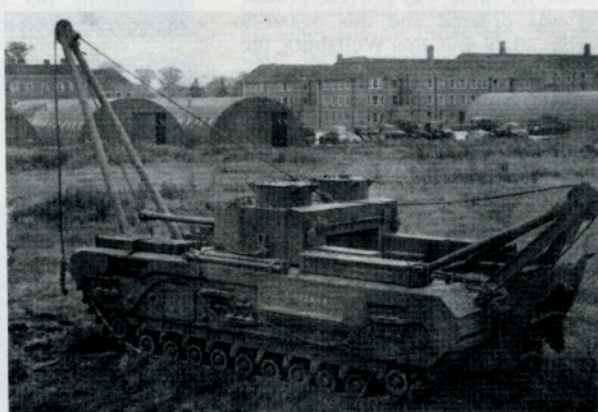
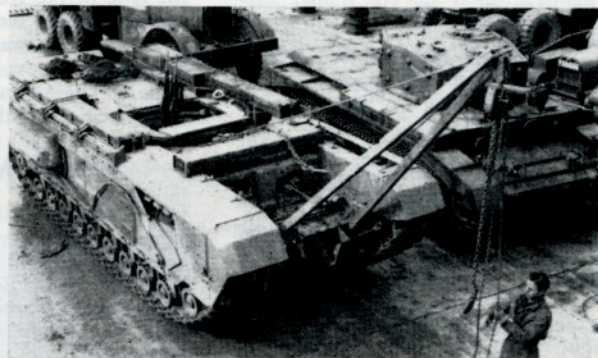
for the attachment of various devices which will be described separately. Brief AVRE specification was as follows: Crew 6 (commander, demolition NCO, mortar gunner, wireless operator, driver, and co-driver/mortar loader); weight 38 tons stowed; armament, one Mortar, recoiling, spigot 29 mm Mk I or II; length of weapon 7 feet 2 inches overall, loading trough 3 feet 9 inches; demolition bomb 40 lb, firing rate 2-3 rounds per minute; effective range with 40 lb bomb, 80 yards. One Besa machine gun in hull. The 6 pdr gunsight was retained for the Petard.

For towing fascines, explosives, and other engineer stores, a simple dropside sledge, known as the AVRE sledge, with steel runners was produced.

AVRE DERIVATIVES

Churchill Ardeer Aggie : Due to a demand for a more powerful demolition weapon than the Petard, the Ardeer Aggie was proposed. Originally called the Ardeer projector, it was a recoilless gun in which the recoil momentum was neutralised by the firing of a dummy projectile to the rear simultaneous with the discharge of the main projectile through the barrel. Development work on this weapon was started in September, 1943, the first prototype being mounted

October, 1967



THE modern advertising of the ageless VW emphasises that it appeared shortly after the end of the second world war. However, this is only partly true as the basic design is of much earlier vintage. As early as 1933, Hitler asked Dr Ferdinand Porsche to design a people's car, which was to be cheap enough and reliable enough to be within the reach of the average family budget. The specification that he put forward in 1934 was basically that familiar in the present-day Beetle. Several pilot models and two pre-production series were built between 1935 and 1938. But as yet no factory existed where they could be produced. Construction of the Wolfsburg factory commenced in 1938.

With the annexation of Czechoslovakia in March, 1939, Germany was finally committed to war. Hitler gave a direct order to Porsche to develop a military version of the Volkswagen. The saloon body, so similar in the present shape, was removed and an open tourer body of rugged construction designed. As it would have to negotiate rough country, the suspension was considerably strengthened and, of course, the gearing was lowered to improve rough performance. The design was ready in December of that year.

The VW Type 82 as it was known was sent to the army for proving. It was not favourably received by the 'traditional' staff who were unable to see any value in a car without four-wheel drive. Despite pressure from Hitler it was not finally accepted until Dr Todt, Minister of Armaments, sent several examples to field units for their comments. The results were astonishing—they found the VW to be every bit as good as similar 4 x 4 vehicles, but in addition it had many advantages, particularly a low weight of about half a ton.

Once its value was proven, production was ordered and this began in March, 1940. But the Wolfsburg fac-

Military Volkswagen



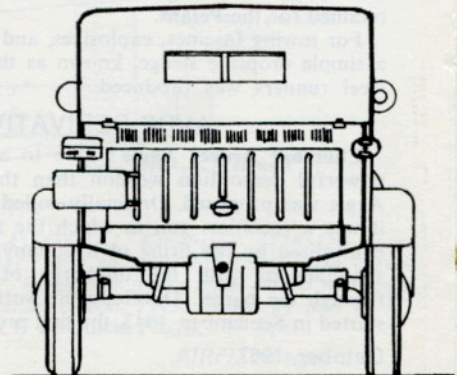
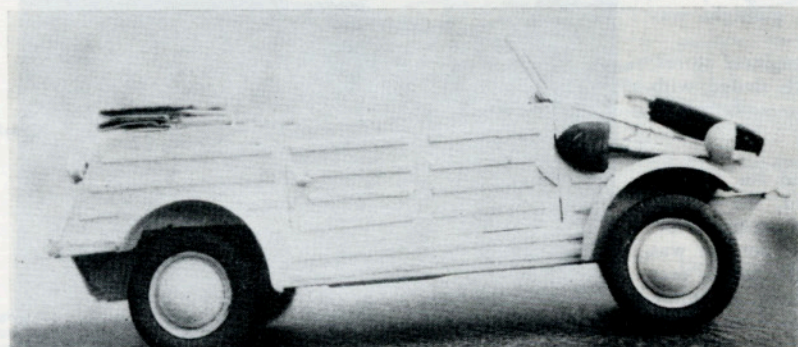
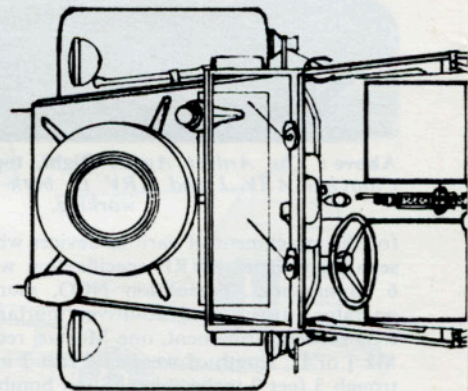
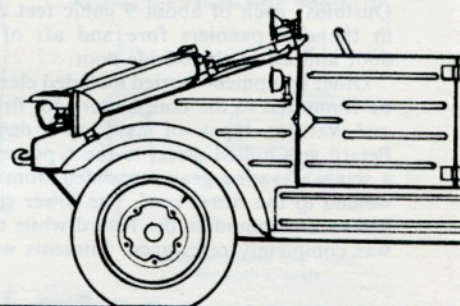
tory was still incomplete and the body panels had to be brought from a plant in Berlin. Production of the original civilian car was now postponed until the military requirements were filled. Civilian production, in fact, did not commence until after the war ended.

Rommel was one of the first generals to use the VW and readily appreciated the advantages of the design. Later, as Commander of DAK in Africa he pleaded for a large stock of these vehicles which were ideal for the desert conditions. The type was also just as suitable for the rigours of the cold of the Russian winter, so the majority were sent there. Relatively small numbers were built due to the limited facilities of the incomplete factory. The total of the Type 82 units completed was only 52,018.

THE MODEL

The Airfix kit provides the basic chassis platform, but this must be carefully trimmed to the shape of the more angular military type. Remove the running boards at the sides and the

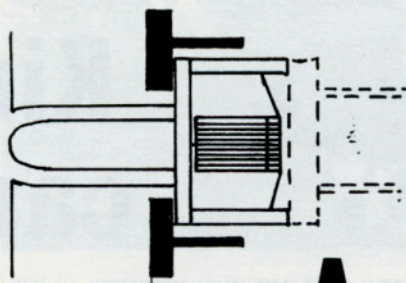
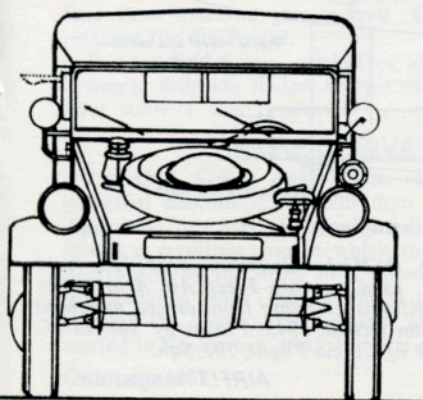
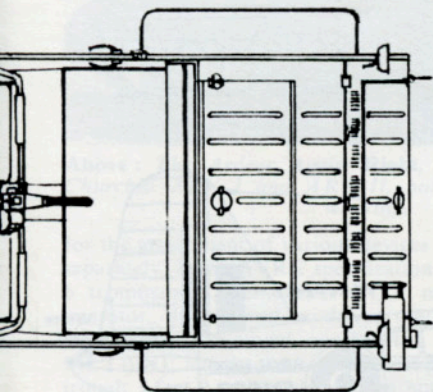
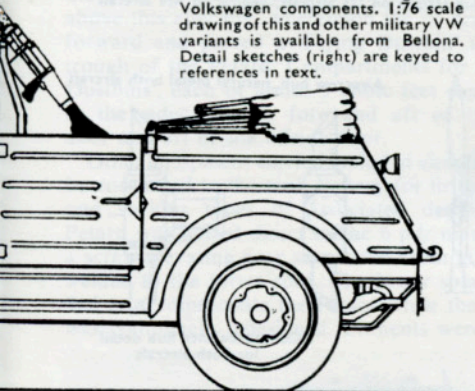
Pictures at top and bottom of this page show the finished model and the detail which can be incorporated in 1:32 scale.



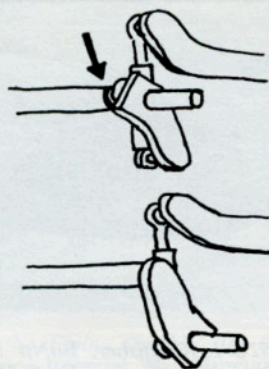
piece of the chassis platform that projects to form the rear of the wheel arches. This is not as hard as it sounds, as one can see the trimming necessary by laying the chassis pan on the scale plan. The silencer box is next cut away and sawn in half; each individual half is now cemented on the front of the engine—this is shown in sketch A, with the new silencer positions in black.

Ground clearance of the Type 82 is considerably more than that provided for in the civilian car. As a guide the

Drawings to 1:32 scale by Hilary Doyle are full-size for model using Airfix Volkswagen components. 1:76 scale drawing of this and other military VW variants is available from Bellona. Detail sketches (right) are keyed to references in text.



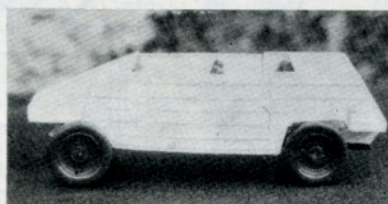
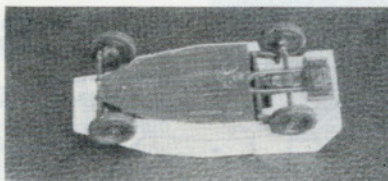
A



B

axes are in line with the bottom of the chassis. The correct way to increase this at the front is by cutting off the swing arms of the stub axles (parts 4 and 6 in the kit) and re-cementing them at an increased angle. However, I tried this and found that it left a very weak assembly, so I tried a less accurate but more durable alternative. Remove the locating lugs on the torsion bar unit (part 3) and cement it in place so that the top bar is the only one in contact with the chassis. In this way the whole unit is lowered and remainder of assembly of front suspension is as per instructions.

The back wheels had a reduction gear housed in the hub and this gave me the excuse for my method of raising the rear. In sketch B the upper view shows the swing arm assembled as in the kit. If the axle is cut at the point indicated by the arrow (drawing B) we can then turn the swing arm upside down, remove the stub for locating the shock absorber, and stick it back on the axle as shown. The shock absorber is then cemented in position to act as a strengthening piece (shock absorbers of the war-time vehicle were of the plunger type).



Top: Underside view of model under construction shows how Airfix VW chassis pan and wheels are used. **Above:** The partially completed model shows the basic box-like body with mudguards and details still to be added.

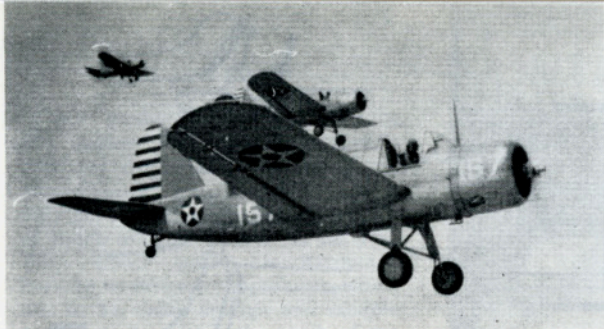
Wheels can now be fitted so as to revolve as normal. At this point one must take care to ensure that the vehicle sits level. The round well at the front of part 25 is removed and discarded; this can then be cemented in place along with the seats, hand-brake, and gear shift as indicated in the kit instructions.

The bodywork is from plastic sheet or card and measurements of the various panels comes directly from the drawing. Start with the sides, cutting two full panels, one for the left side the other for the right. I found it best to cut away the doors and then re-cement them in place again. Thin strips of card are cut and placed on the panels to give the ribbed effect. Hinges, door handle panels, etc. can also be fitted at this stage. When the side panels are in place, cement a bulkhead across the back of the back seat so that it completely separates the engine compartment from the passenger space. The remainder of the back panels of the body are now put in place. Then cover in the space around the engine with pieces of card.

The front bonnet panel comes next. The way to provide a dashboard is to turn the existing one upside down and trim it to fit—in this way we get the speedometer to the left side. The details for the bonnet panel are as follows: flat pieces of card to represent the petrol tank, which can be seen underneath the windscreen on the drawing; for the filler cap, I used a spare wheel retaining bush cemented to one of the tail indicator housings suitably sanded down. Ribs under the spare wheel are of heavy card. Unfortunately, it is necessary to use two kits to get the spare wheel, but parts will always come in useful at a later date.

Next come the mudguards and headlights—the former can be formed from card, and the latter carved from balsa if one has patience. As an alternative, the 1926 Morris Cowley kit has headlights, which are just right,

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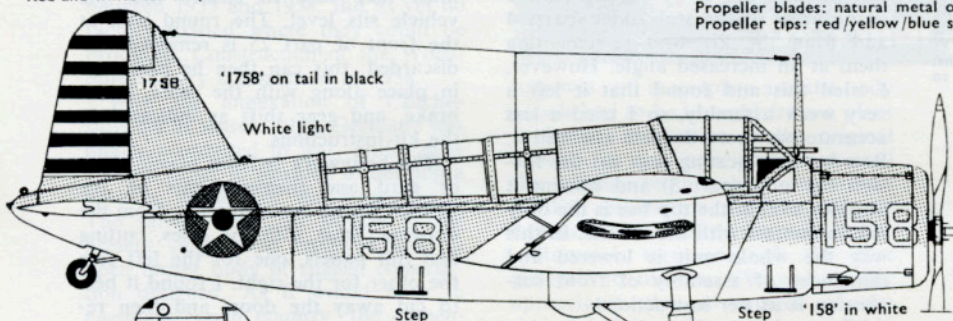
Kingfisher camouflage

By Nick King

Above: OS2U-1 Kingfisher, BuNo 1757, coded 157, from Pensacola Naval Air Station, USA, May 1942. This machine is a sister aircraft to 158, drawing A on this page, and wears the same colour scheme. (Photo Flt Lt Adams, via M. Sarbett.)

Red and white tail stripes

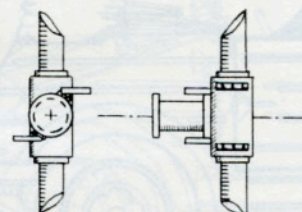
Propeller blades: natural metal on US aircraft, black on RN aircraft
Propeller tips: red/yellow/blue stripes on US aircraft, yellow on RN aircraft



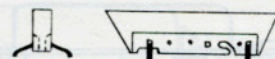
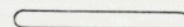
A

Side elevations are to 1:72 scale.

Aircscrew hub, natural metal both aircraft

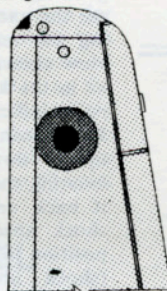


Counterbalance hub detail for both aircraft



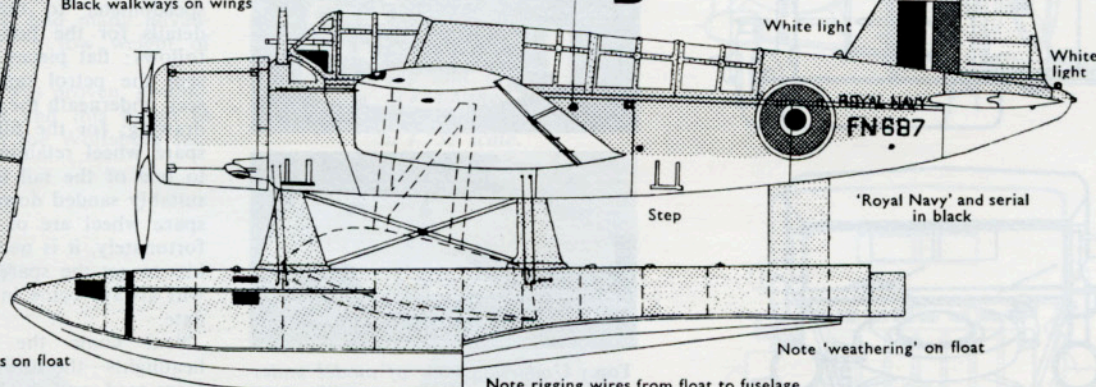
Bomb rack detail: FN687 only

Green light



B

Black walkways on wings



White light

White light

'Royal Navy' and serial in black

Note 'weathering' on float

Note rigging wires from float to fuselage

Red warning stripe on float

Wingtip float dotted for clarity

Colour Mixes (both aircraft)

Light grey (undersides): 1 pt matt white, touch of Airfix M2 or H27.
Blue-grey (upper surfaces and float tops): 1 pt Airfix M2 or H27, 1/2 pt matt blue H25, 1/2 pt matt white.

Drawings show: (A) OS2U-1 Kingfisher 1758:158 from Pensacola, May 1942, used to train Fleet Air Arm crews. (B) OS2U-3, FN687, Kingfisher flying from armed merchant cruiser Cilicia in Indian Ocean, 1943. Flown by Sub Lt W. Soady, CO of Cilicia Flight, 703 Sqn.

AIRFIX magazine



Above: Two views of Kingfisher FN709 of 703 Sqn (Cilicia Flight) showing the aircraft on the catapult ready for launching (left) and being recovered by the ship's crane (right). Colour scheme of this aircraft was the same as that in drawing B.



Above, left: Rare picture of a Kingfisher in SEAC markings in 1944-45, squadron unknown. Note that the original red/white/blue/yellow roundels which were overpainted show faintly through covering coat of paint. SEAC roundels were azure blue/roundel blue with corresponding fin flash. Serial is FN718 in 8 inch characters with 'ROYAL NAVY' in 4 inch. Upper wing roundels are in usual position, but underwing roundels are well inboard. Colour scheme as shown opposite.

Above, right: Another rare shot shows Kingfisher A48-13 of the RAAF operating from Wyatt Earp in the summer of 1948 with the Australian National Antarctic Research Expedition survey of the Balleny Island group. Pilot of the aircraft was Sqn Ldr Gray. Overall finish was semi-gloss 'International Orange' (one part Humbrol Orange gloss mixed with one part BR Orange Lining 132), black serial, roundels in six position, black prop with yellow tip, and fin flash against bottom of rudder hinge line. Cockpit interior dark green with black seats. Prop hub was natural metal.

The Churchill Tank—from page 59

fitted so that it could be easily erected, and gas cutting and welding equipment with tools and repair equipment was stowed in the hull. A crew of three was carried including the driver. The ARV Mk I was primarily an armoured tug having a drawbar connector fitted at the rear. The jib booms were carried on the sides and when required they were mounted on the front of the vehicle and raised by a wire rope clamped to the track. The chain block carried at the head of the boom was capable of a three ton lift. Armament consisted of a 7.92 mm Besa machine gun in the hull, and two Bren or Sten guns. Weight was 33 tons.

The Churchill ARV Mk II was based on the Churchill Mk IV chassis, the standard turret being replaced by a fixed turret fabricated from 40 mm armoured plate welded to the roof of the vehicle, with a turret roof of 14 mm plate carrying two cupolas. A dummy 6 pdr gun was mounted.

The special equipment carried consisted of a dismountable forward or front jib capable of supporting a 7½ ton load, a fixed rear jib for lifting or giving a combined lift and haul of 15 tons, and a two-speed winch driven from the engine capable of developing a direct pull of 25 tons through the winch rope which passed from a drum through a rectangular opening in the rear plate of the turret with suitable guide rollers. A spade-type earth anchor was hinged at the rear of the vehicle to prevent rearward movement of the vehicle.

October, 1967

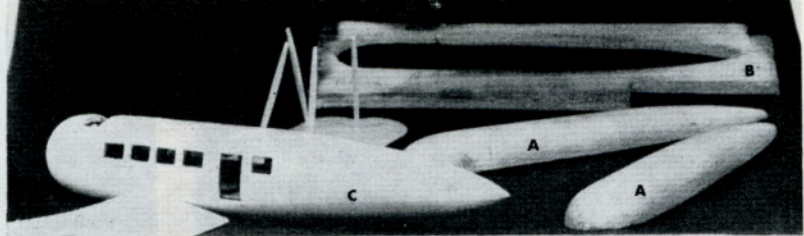
when the winch pull exceeded the tractive resistance of the AFV. Miscellaneous equipment and tools including 25 ton snatch blocks shackles, tow ropes, and gas welding equipment was carried for the crew of four. Weight of the vehicle was 40.1 tons. Armament consisted of one 7.92 mm Besa in the hull and one Bren gun.

There was also a Churchill BARV which was an adapted version of the ARV I, for beach recovery. Shingle plates were fitted over the bogie assembly and wading gear was installed as required.



Post-war successor to the AVRE was the Churchill AVRE Mk VII in which a 165 mm demolition gun replaced the Petard mortar. Last Churchill variant in front-line service (until 1965), this vehicle will be dealt with separately.

Right: All you need—except for the necessary skill and patience—for moulding fuselages. A—the fuselage master moulds; B—the female mould; C—the Vickers Vernon fuselage with doors and windows cut out.



Mould your own fuselage

J. WILKES OFFERS AN IDEA FOR ADVANCED MODELLERS

KENNETH JONES'S article on moulding (July issue) suggested that aircraft radomes could be moulded in the same way as canopies and turrets. By using a related process, I found that whole aircraft fuselages in plastic were possible. As I had previously determined to build a Vickers Vernon transport it was this that I decided to use as a prototype moulding exercise.

The way to make a moulded fuselage is in two halves like a plastic kit, so to do this a split mould must be carved; the best way to make it is to use a sheet of balsa wood, half the thickness of the fuselage, and roughly cut two fuselage halves from it. Then fix the two halves together with a few spots of UHU and leave it to set. The mould is now worked in the same way as a conventional balsa carving. It should be shaped according to plan and sanded down to about .75 of the thickness of styrene sheet used less in all dimensions than the actual scale size. In other words, if you use 40 thou card, sand the mould 30 thou under scale.

The male mould should be free from most irregularities but need not be finished to a high degree as this has no effect on the finished product; cockpits should not be hollowed out.

To separate the halves take a double edged razor blade and locate the joint between the two portions, place the blade in the seam and press firmly taking care not to cut into the wood. Perfectly flat faces should result. The halves must not be worked on in any way after separation.

The next step is to produce the female part of the mould. The way to make this part is well known, but a few warnings would not come amiss. First use a large sheet of $\frac{1}{4}$ inch balsa so that when the hole is cut it does not weaken the sheet too much; always cut the fuselage hole with its longitudinal axis parallel to the grain and

cement two strips of scrap balsa across the grain at each end to prevent cracking. Draw the shape of the hole by tracing round one of the male moulds, an allowance being made for the plastic sheet used, which amounts to a little under the thickness of the plastic.

With the moulds complete the next operation is to make the fuselage itself; the source of heat I used was the gas flame from a cooker which I chose in preference to an electric fire due to the greater ease of regulation and a more local heat.

The plastic card was cut allowing about two inches on either side of the hole to cater for the sheet drawing inwards; it was pinned to the female mould at each of its corners.

The mould and plastic card were held over the flame until the plastic became floppy and started to sag. Then one half of the male mould is pressed firmly through the hole, pulling the styrene sheet with it. The process is then repeated with the other portion of the mould.

Would-be moulders must, however, note that each male half should be inserted from a different side of the female mould, this makes a lot of difference to the finished product.

In the foregoing it would appear that the job is a simple one, but in practice it is not so easy. I believe that the most common fault will be a re-

luctance for the sheet to stretch to the full depth of the cross-section. The way to cure this is to hold the two moulds and card over the flame, the flat face of the male mould being nearest to the heat. This should soften the card enough to push the mould home. Do not hold them too close to the flame for at this point I burnt my fingers and the moulds caught fire!

If the method just described does not work, cut the moulding out roughly and place the male half into it; hold the deformed part of the moulding over the flame of a small paraffin lamp or a candle and gently, with the tip of a finger wrapped in a piece of cloth, smooth the softened area on to the male mould; this should result in a perfect edge.

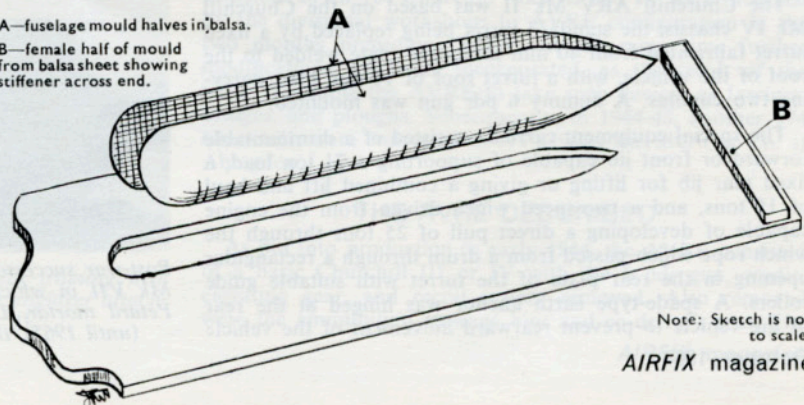
If the sides of the moulding are too thin, this is because the female mould is too small and this can be rectified by sanding the sides of the hole.

To finish the fuselage halves place the male sections into their respective mouldings and file the edges flush with the top of the mould; if this is done carefully a level joining surface should be produced. An additional aid to levelling the edges of the mouldings is a scratch board which consists of a sheet of fine sandpaper glued to a flat piece of plywood. The moulding is placed

Continued on page 72

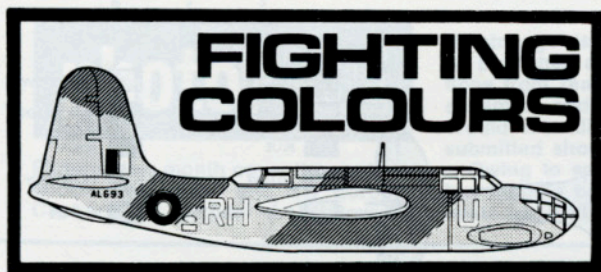
A—fuselage mould halves in balsa.

B—female half of mould from balsa sheet showing stiffener across end.



Note: Sketch is not to scale.

AIRFIX magazine



Top: A predecessor of the Blenheims, Demon K4504 wears the red (dark area) and yellow triangle squadron markings of the peace-time era. **Above:** Gladiator RR-T of 615 Sqn in the summer of 1939 at Kenley. Serials were over-painted, codes light grey, fuselage roundels bore traces of the white rings and the usual colours had been applied (Photo via Ron Clarke).

Sqn	Letters	Example	Aircraft type	Notes
41	EB	K9991	Spitfire I	February, 1940
43	FT	L1726:D	Hurricane I	ex-NQ-D. Many squadrons re-allocated the individual letter on re-coding; this was an exception
46	PO	N2652	Hurricane I	May, 1940
54	KL	N3124	Spitfire I	February, 1940
56	US	L1983:N	Hurricane I	February, 1940
64	SH	L8371	Blenheim If	February, 1940
65	YT	K9906:T	Spitfire I	February, 1940
66	LZ	N3033	Spitfire I	February, 1940
72	RN	K9936	Spitfire I	February, 1940
73	Nil;	P2569:D	Hurricane I	Winter, 1940. Later example: TP-D:2569
74	TP later	ZP	K9933:Y	Spitfire I
79	NV	L1698:8R	Hurricane I	February, 1940
85	LK	P2798:A	Hurricane I	October, 1939
87	VY	P3119:X	Hurricane I	May, 1940
111	JU	L1973:L	Hurricane I	March, 1940
151	DZ	N2651	Hurricane I	October, 1939
213	AK	L1882	Hurricane I	April, 1940
501	SD	L1624:R	Hurricane I	October, 1939
504	HX	L1941	Hurricane I	December, 1939
600	BQ	L6639:M	Blenheim If	September, 1939
601	UF	L6603	Blenheim If	November, 1939
602	LO	L1005	Spitfire I	September, 1939
603	XT	L1007:K	Spitfire I	January, 1940
604	NG	L6608:B	Blenheim If	October, 1939
605	UP	N2349	Hurricane I	October, 1939; previously WQ-B. Sqn changed unit letters only on aircraft
607	AF	P2564	Hurricane I	April, 1940
609	PR	P9427:P	Spitfire I	May, 1940. Code open to question
610	DW	N3289:K	Spitfire I	May, 1940
611	FY	K9999:D	Spitfire I	December, 1939
615	KW	K7976:A	Gladiator	January, 1940
616	YQ	L1055	Spitfire I	May, 1940

A second change was evident on fighters when in October, 1939. Type A roundels appeared under the extreme tips of the wings on many machines, this becoming standard during 1940 and remaining today. Fuselage roundels changed to Type A too, by the addition of a white ring or by enlarging existing roundels to resemble those of pre-camouflage vintage with the centre disc in diameter usually the equal of the width of the other rings. Serial numbers by now had largely

Continued on page 67

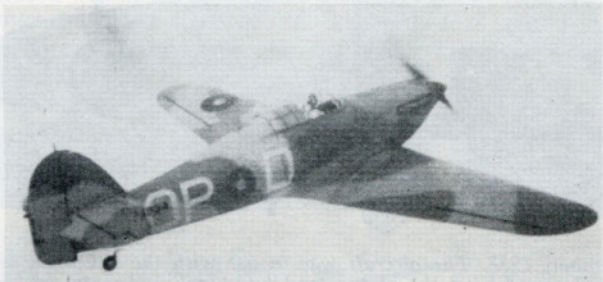
Part 2: Fighters 1939-40

ALTHOUGH Hurricanes and Spitfires formed the backbone of the fighter force in September, 1939, seven squadrons (Nos 23, 25, 29, 64, 600, 601 and 604) had Blenheim If long-range fighters. These were Blenheim bombers, the first few modified at Nos 24 and 27 MUs, carrying a four-machine-gun belly pack. Conversion and planning was quite hasty, trial installation being made at RAE on L1424 in November, 1938, and test firings a few days later at Martlesham. In mid-December, 1938, L1433, '36, '37, '39 and '40 reached 25 Squadron as the first examples to enter service. By the end of February, 1939, the seven squadrons had them, and most were almost fully equipped. From their entry to service they had dark green and dark earth upper surfaces with black and white under surfaces as prescribed, the colours meeting half-way beneath the fuselage. A few weeks later they adopted their pre-war squadron identity letters, applied in mid-grey.

THE AUTUMN DAYS

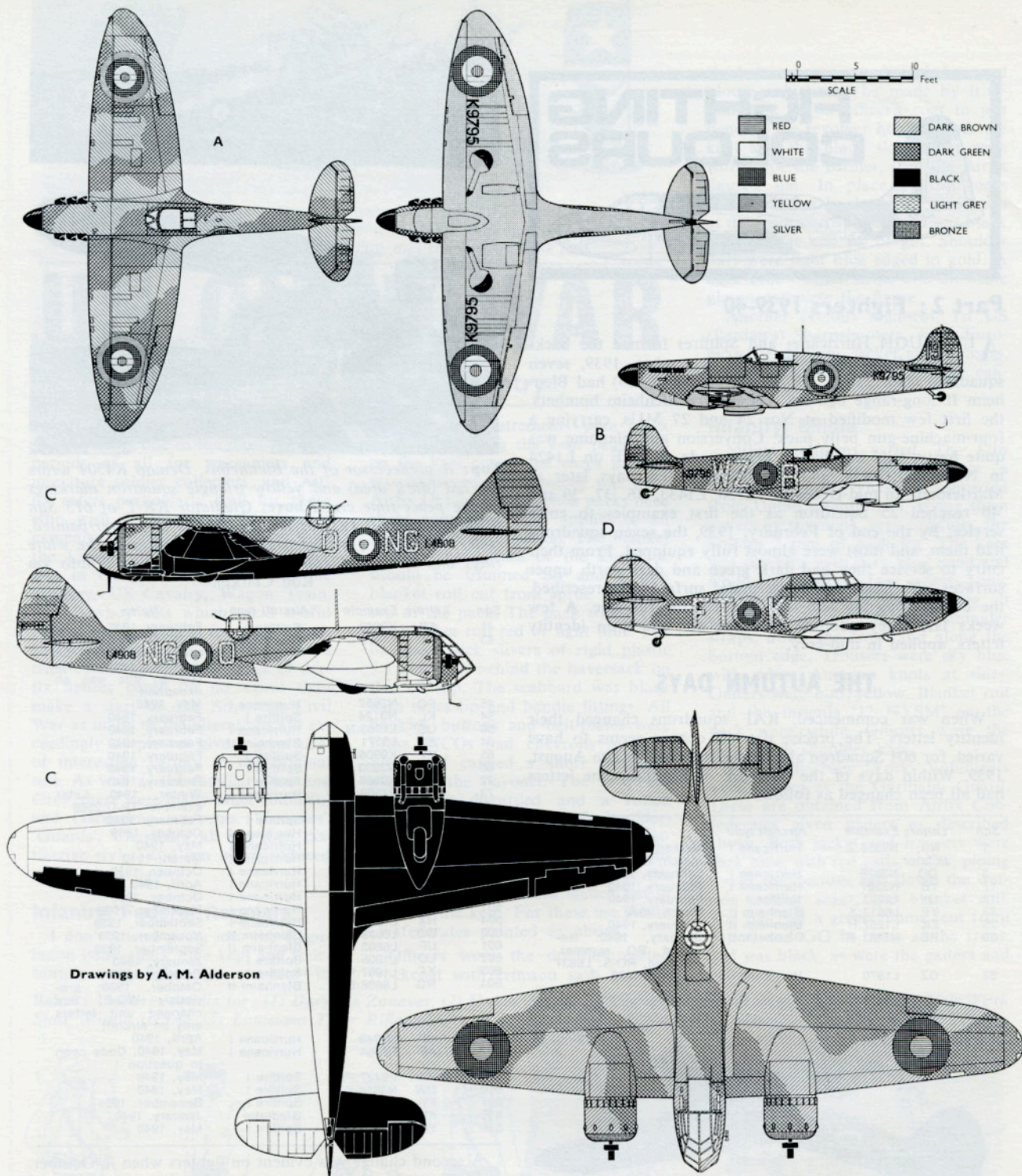
When war commenced, RAF squadrons changed their identity letters. The precise date of change seems to have varied, for 604 Squadron altered theirs to NG in late August, 1939. Within days of the outbreak of hostilities the letters had all been changed as follows:

Sqn	Letters	Example	Aircraft type	Notes
1	Nil;	N2358:Z	Hurricane I	Marked 'Z' only in March, 1940, in France
3	JX later			
17	QO	N2828	Hurricane I	February, 1940
13	YB	N2397	Hurricane I	February, 1940
19	QV	L1031	Spitfire I	February, 1940
23	YP	L8617:X	Blenheim If	March, 1940
25	ZK	L1257:H	Blenheim If	February, 1940
29	RE	K7181:P	Blenheim If	January, 1940. Re-coded RO summer, 1940: eg, RO-S: L6637
32	GZ	L1970	Hurricane I	October, 1939



L1934:OP-D of No. 3 Squadron flying in about July, 1939. The single upper wing roundel was featured by quite a number of fighters including Spitfires. Previously Type A.I roundels had been carried—although this aircraft was not delivered until May, 1939.

October, 1967



Drawings by A. M. Alderson

(A) Spitfire I K9795 of 19 Sqn, Duxford, as recorded in November, 1938. The aircraft was in use with the squadron at the outbreak of war, and by then carried 'WZ' coding, revised roundels of the period, and had black and white under surfaces. (B) K9795 in its April, 1939, style of markings. (C) Blenheim If L4908 of 604 Sqn in January, 1940, when stationed at Northolt. It had joined the squadron in April, 1939, and then wore pre-war coding and red/blue Type B roundels. It was damaged beyond repair during the Battle of Britain, when it was serving as a night-fighter. An anomaly appearing here is the absence of under-wing roundels. (D) Hurricane I FT-K, a machine of 43 Sqn as recorded in November, 1939. Its serial was painted out, and the airframe number remains unknown. Note the under-wing roundel and the factory finish beneath the nose. A two-blade propeller was fitted.

Fighting Colours—continued

crept back into place on the rear fuselages of fighters, and were black, eight inches high.

Some of the Blenheim Ifs seemed to lag in these respects, for I saw many as late as March, 1940, without the under-wing roundels.

INTO BATTLE

Although there was comparatively little action before the German invasion of Norway the fighters stood at readiness, and were engaging raiders over the North Sea. About 400 enemy sorties were made and 40 bombers destroyed in raids on shipping and naval bases. The first major enemy attack occurred on October 16 when nine bombers of KG30 attacked warships in the Firth of Forth. Spitfires of 602 and 603 (eg. L1048) Squadrons engaged them and two enemy aircraft were destroyed. On October 28 the two squadrons brought down a He 111 of KG26 on the Lammern Hill. An interesting feature of the machine was that it had two Balkenkruz markings above each wing, the smaller being near the tip. Throughout the winter individual engagements were fought, N2340 of 111 Sqn flown by Sqn Ldr H. Broadhurst destroying a He 111 on November 29, nine days after 74 Sqn had their first success over the Thames Estuary. L1744, FT-A of 43 Sqn destroyed a He 111 at sea on January 30, and L1723:FT-N shared another (off Whitby) with L1727:FT-R on February 3. Flt Lt Peter Townsend, flying L2116 of 43 Sqn, with L1847:FT-J and another Hurricane, brought down yet another He 111 at Sneaton Castle Farm, near Whitby, the same day; an He 111H Werke Nr 2323 from KG26. The Hurricanes involved wore standard markings with under-wing roundels.

EXPANSION AGAIN

In September, 1939, the AOC-in-C of Fighter Command was pressing for 12 new squadrons, but production was such that there could only be the possibility of forming two equipped with Blenheims. Six extra Hurricane squadrons had been alerted for France, then came the German raids at an opportune moment. On October 17 the CAS had called a meeting to discuss the requirement and it was formally agreed that four 'half squadrons' of Blenheims to be used as night-fighters mainly, two 'half' training squadrons and two whole squadrons (to replace any 'lost' to the French theatre) should now form by the end of October. Then somewhat surprisingly, with a view to the battles to come, it was decided that ten more should form in the next fortnight. In the event it was December before all were going concerns. One feature of interest arose as a result, for there were not enough fighters for the squadrons. Thus, Tutor and Magister trainers joined the units which also received Battles, these latter machines



NG-N of 604 Sqn reputedly photographed on 'Squadron Embodiment' on August 24, 1939. If the date is correct then the application of wartime codes was premature.

actually wearing fighter camouflage! But in the main they received Blenheims, the fighter versions of which are known to have included these: L1164, '68, '77; L1265, L1397-99; L1401, '2, '4, '6, '8, '9, '19, '23, '24, '33, '36, '37, '39, '40, '47-78; L1500-1519; L6599, L6600-05, '07-21, L6644-46, '71, '75-89, '91, '99, L6710-12, '19, '21, '23-27, '28-39, '41-50, '52, '60; L6790-6812, L6835-43. An interesting addition to a few of the Blenheim squadrons during the period under review was the Mk IV fighter the first of which, N6233, had gone to 25 Sqn on August 30—along with N6196. Another, N6193 also with 25 Sqn, was fitted with AI Mk III with full external aerial array, and was in the hands of 248 Sqn at Hendon by February, 1940. Three 600 Sqn Mk Is also had AI Mk III.

The new squadrons added to the fighter force at this period were as follows:

Sqn	Letters	Example	Type	Notes
92	GR	L6776:D	Blenheim If	Formed 10.10.39
141	TW	L6729	Blenheim If	Formed 4.10.39
145	SO	K7159:N	Blenheim If	Formed 10.10.39
152	SN	K7972	Gladiator I	Formed 1.10.39
219	FK	L8685:N	Blenheim If	Formed 4.10.39
222	ZD	K7161	Blenheim If	Formed 5.10.39
229	KE	L6472	Blenheim If	Formed 10.39
234	AZ	L1330	Blenheim If	Formed 30.10.39
235	QY	L5312	Battle	
	QY	L1367	Blenheim If	Formed 30.10.39, passed to Coastal Cmd, 27.2.40
236	ND?	L6801	Blenheim If	Formed 31.10.39, passed to Coastal Cmd, 29.2.40
242	LE	L1521	Blenheim If	Formed 10.39
245	DX	L6796	Blenheim If	Formed 10.39
247	ZY	N5576	Gladiator II	Formed 22.11.39, as 'Fighter Flight, Sumburgh'
248	WR	L1336:E	Blenheim If	Formed 30.10.39, passed to Coastal Cmd, 20.6.40
252	SW	L5110	Battle	Formed 30.10.39
263	HE	N5579	Gladiator II	Formed 2.10.39
264	FS	L6965	Defiant	Formed 3.10.39; pre-war code allocated was KV
266	UO	P5244	Battle	Formed 30.10.39; pre-war code allocated was AO
229	KE	L1889:E	Hurricane I	April, 1940
253	SW	L1660:F	Hurricane I	April, 1940

In their green/brown-black/white colouring the aircraft of the new squadrons took their place in the enlarged defence system.

FIGHTERS IN NORWAY

The German invasion of Norway brought high states of readiness, but the campaign was fought beyond the range of all the fighters except the Blenheims, whose range in any case gave them little time for fighting so far from home. To provide some protection to British troops ashore in Norway it was decided to take No 263 Gladiator squadron aboard HMS *Glorious* on April 22. Two days later its aircraft including N5579, 5633, 5909 and 5915 were ashore, and operating from the frozen Lake Lesjaskog. By noon next day ten

Continued on next page



A group of Blenheims of No 604 Sqn with NG-O:L4908 nearest. The Wellingtons in the far distance have arrived on the station (Northolt) for fighter affiliation training since an 'air fighting development unit' then occupied the station.

Fighting Colours—continued

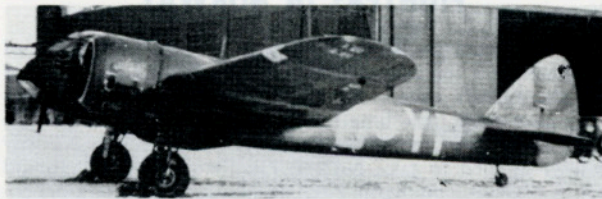
of the 18 aircraft had been put out of action, after very gallant action. The remnants eventually withdrew to Setnesmoen where only one was left and there was no petrol, when the remaining crews withdrew on April 27 to sail home on a cargo ship.

On May 14 a reformed 263 Squadron again set off for Norway and on May 22 began installing its aircraft at Bardufoss. Again the story was the same—valiant and intense action, and crippling losses which culminated in the loss of almost the entire squadron aboard HMS *Glorious* on June 8, along with No 46 Squadron and its Hurricanes (eg, L1793, 1814, 1980, N2543, P2652). As is so often the case, whilst the serial numbers of the aircraft involved in this tragic episode are known their individual aircraft letters seem unrecorded which, for model makers, is most unfortunate. Three other Gladiators used at an earlier date by 263 Sqn at Filton and, like those used in Norway, painted in the standard mid-winter scheme, were K7942: HE-H, K7944: HE-Q and K7946: HE-R.

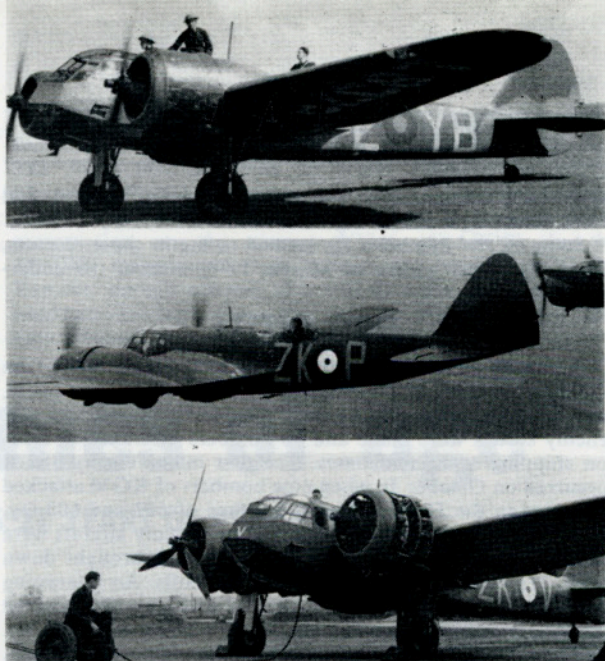
ACTION IN NORTH-WEST EUROPE

A few days after war began, four squadrons of Hurricanes moved to France, where they could be seen exhibiting unusual features. Nos 1 and 73 Squadrons joined the AASF at Vassincourt. They soon abandoned their squadron letters, leaving only one grey letter in the aft positioning. Their black/white under surfaces with wing tip roundels remained, but their rudders carried red-white-blue stripes covering the entire surface, red forward, as an added international identity marking. Spinners were black. L1842, a No 1 Sqn machine, shot down a Do 17 near Toul on October 30 and on November 23 it claimed an He 111 near Saarbrücken in two well-recorded combats.

Nos 85(VY) and 87(LK) Squadrons joined the Air Component in September, 1939, and retained squadron letters. Typifying the usual anomalies, 85 Sqn opted for three-foot code letters and both usually had two-foot diameter red/white/blue Type A fuselage roundels. 85's aircraft carried a white hexagon on the fins of its machines, measuring 18 inches across. This was a curious feature for it revealed the unit, being 85's well known motif. On the three-bladed airscrew Hurricanes received early in 1940 larger roundels were observed. The blue and white rings were 5 inches wide and the red 4 inches across on some, whereas others, rather surprisingly, had their fuselage roundels with each band of different width, namely 7 inch blue, 8 inch white and 6 inch red. When 87 Sqn received the later Hurricanes it applied two-foot code letters, but 87 maintained the larger type. 87's Hurricanes had on their fins a white arrowhead like the fighters had carried before the war, on which was painted their badge.



YP-Q: L67?? a Blenheim 1f of 23 Sqn in the snow at Wittering in the winter of 1939-40. Light grey codes and black/white undersurfaces (Ministry of Defence photo).



Top to Bottom: L8372: YB-L of 29 Sqn with black/white undersurfaces and very light grey codes. The four-gun tray is visible under the fuselage. L8372 was with the squadron from January-August 1939, when it went to 604 Sqn. ZK-P: L1437 wearing January, 1940, style markings. K7090: ZK-V of 25 Sqn with black/white undersurfaces. 'V' appears on nose in white, other letters being grey. K7090 was originally delivered to 144 Sqn as a bomber in October, 1937 ('Aero-plane' photos).

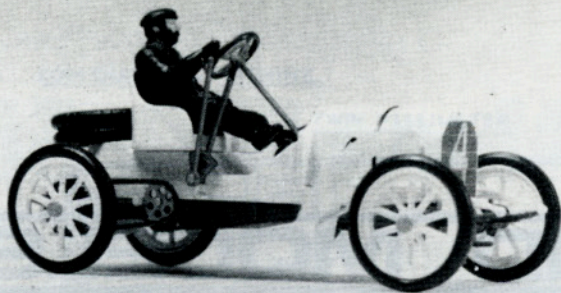
Two Gladiator squadrons reinforced the Hurricanes in France, No 615 (KW) and No 607 (AF?). The latter had flown defensive sorties from the UK and on October 17 three Gladiators had forced a Do 18 into the sea. 615 took over 605's Gladiators at Croydon in October, 1939, and both squadrons flew to Merville in November. They made patrols but had no engagements before the *blitzkrieg* of May. There had, incidentally, been five biplane squadrons active on September 3, 1939, the others being Nos 603, which flew Gladiators on a few patrols, and No 616 which still had Gauntlets but never flew operational missions.

On November 18 the air war took on a new phase when He 115s of *Küstenfliegerstaffel* 3/906 made the Luftwaffe's first (unsuccessful) attempt to lay magnetic mines off the East Coast. Two nights later they dropped mines off Harwich and in two positions in the Thames Estuary. Heinkels of 3/106 joined in on November 22, and this brought forth a response from 12 Blenheim fighters of Nos 25 and 601 Squadrons firing their guns in anger for first time during a daylight beat-up of the seaplane base at Borkum on November 25, when 25 Sqn's complement included L1437, L1440 and L6676, an action repeated on November 28.

Judged against the later stages of the war this period has always been considered dull. From an interested observer's point of view it was far from that, for there was so much to see that was strangely unfamiliar—new squadrons, modified Hurricanes and Spitfires, Battle fighters, the large day bomber formations, much practice flying, and of course those fascinating Wellingtons of the GRUs with their anti-mine hoops—but that is another story, and so is the opening of the onslaught against France and the Low Countries in which once more the Blenheims were to play an early pathetic part.

Michael J. F. Bowyer

AIRFIX magazine

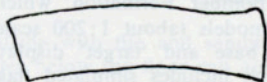


Jenatzy, complete with red beard, at the wheel of his 1903 Gordon-Bennett Mercedes, converted from the Airfix kit. Note the mudguard only on the driver's side and the new chain-drive sprockets.

TWO FOR CAR CONVERTERS

Derek Bannister makes a 1903 Mercedes and Birkin's Bentley

RECENT Wheelspin articles by Bert Lamkin have given details for motorising the old-time cars in the Airfix 1:32 range and mention was made in passing of the various adaptations which could be incorporated in the models to give that 'Brooklands' look associated with competition cars of earlier days. Lots of readers asked us to go deeper into the subject so here are two of the possibilities which should appeal not only to slot-racing fans but also to those who assemble the kits in their static display form. In fact, both models, the 1903 Gordon-Bennett Mercedes and Birkin's 'Blower' Bentley are statics from my own collection, but the details are perfectly applicable to motorised slot-racing versions as well. Bert Lamkin gave motorisation details for the Mercedes in the May, 1967, issue of AIRFIX magazine and a similar Wheelspin article on motorising the Bentley will appear shortly.

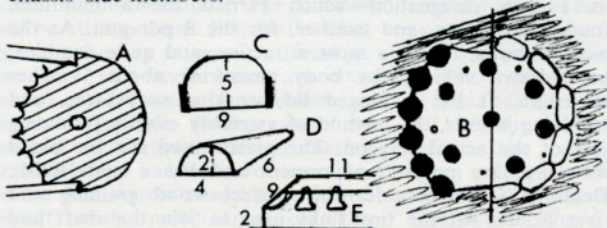


Full-size drawing for Mercedes mudguard; make from card. Bottom end on right.

1903 Gordon-Bennett Mercedes

The kit prototype was a 1904 18/28, a staid tourer which nevertheless was raced by its first owner in the early days of Brooklands (lap speed 55 mph). After the 1939-45 war it was superbly restored and a replica Gordon-Bennett body fitted. This means that nothing major in the way of alterations is required to make an excellent replica of a famous racing car.

First of all consign to the spare-parts box all wings, lamps and brackets with the exception of numbers 25 and 31. 25 is used in the hole intended for 29 and 31 is angled back to give the flair of the wing. For the same reason bend the top of 25 upwards. Fill all the remaining bracket holes with body putty or similar filler and cut off the lamp brackets from part 2 (dashboard). Holes in the fuel tank intended for the rear lamps will need filling while you are about it. Smooth off the spring markings on the top front of the two chassis side-members.



Sketches, not to scale, show Mercedes and Bentley modifications referred to in text. Dimensions marked in millimetres. In E, outer line marks gauze cover. In A remove original sprockets, shaded, but retain chain from kit.

The car actually raced with a bare chassis behind the seats and the boot was removed. Part 6 must therefore be cut down immediately behind the seats and parallel with the seat-backs if you want to depict the car on race day. The resulting gap can be neatly closed with plastic card.

The front sprockets in the kit are too small, and if you haven't suitable replacements in stock a pair must be made up. This is nothing like as tricky as you might think. First mark out a circle 9 mm on a suitable piece of plastic card as in fig B. Drill out the centre spot so that the finished sprocket fits neatly on part 14, the gear box. About 1 mm from the outer edge drill six equally spaced holes $1\frac{1}{2}$ mm wide. If you feel ambitious, drill very small holes between each. Next, round the part of the sprocket not engaged by the chain, drill a series of nearly-touching holes $\frac{1}{4}$ mm wide. When you at last cut the sprocket from the sheet of plastic you will have a neat series of teeth. Reference to the drawing will make this clear. Now cut slots to take the lengths of chain, and round the driving edge of the sprocket glue scraps of plastic card about 2 mm long which will simulate very realistically the side plates of the chain. Now glue to the rear sprocket and chain already prepared as in fig A.

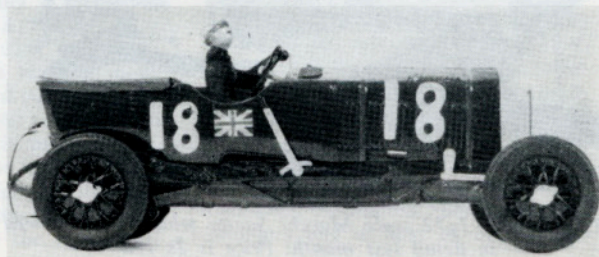
Only the driver had the benefit of a mudguard, as given on this page. Good quality card, or better, plastic card should be used for this. Before fitting it is advisable to wrap round a pencil or similar, to get the right curvature. Otherwise the kit is made as per instructions and a couple of spare tyres are 'lashed' to the rather bare rear of the car. The whole of the car including the radiator was white, seats bright red. Floor matt brown, I imagine with 'wooden' dash.

My numbering I did in Indian and white inks as it is easy to wash off a bad effort. Letraset may nowadays provide the correct style and size. The figure 4 appears in black behind the strap on each bonnet side, probably on the back of the driver's seat and in white on the radiator grille.

The driver should be clothed in dusty 'leathers' and given a red beard as Jenatzy was known as 'The Red Devil'.

Continued on page 75

The Airfix Bentley altered to Birkin's car. Note aero screen and folded cover from gauze. Rear view mirror is on left side of scuttle.



NEW

KITS AND MODELS

MORE RED LABELS

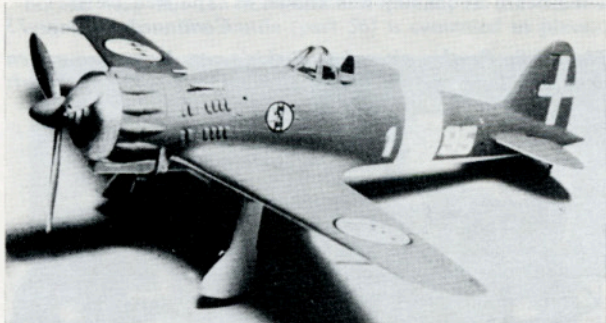
BMW Models of Wimbledon now have further releases in the Japanese-made Red Label 1:72 scale range of aircraft kits. First is yet another Curtiss P-36A Mohawk which appears to be very accurate and well detailed. Method of construction generally follows that of the Heller P-36 but there is rather more to the kit, including provision for motorisation—but no actual motor—sliding cockpit canopy and movable flaps and ailerons which are nicely done. Panel and rivet detail is commendably discreet and this kit should appeal to those who like to exhibit their models in airfield scenes and so on where the working parts lend themselves to action scenes with mechanics, etc. Instruction sheet is in Japanese but the diagrams are easy to follow. The transfers are a little indifferent—and no painting details are given—but squadron codes are included.

Two other kits released at the same time as the P-36 are the M6A1 floatplane and A7M2. The M6A1 is very simple indeed and clear instructions and only 18 components, so should be well within the capabilities of youngsters. The only working features are hinged ailerons and a rotating propeller. The A7M2 has a retracting undercarriage and folding wingtips. Both these kits are less well done than the P-36. Price of each is 4s 11d. *C.O.E.*

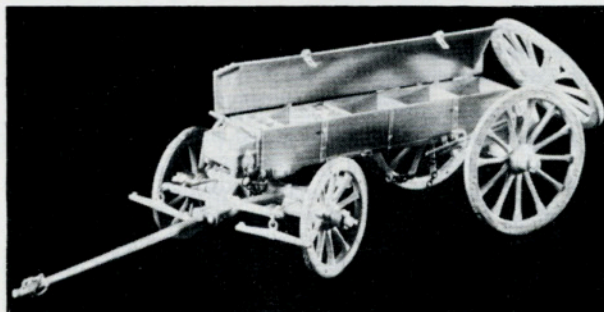
GIFTS FROM LESNEY

IN addition to making their 'Yesteryear' models available in standard form, Lesney have for some time produced an increasing number of decorative desk top items which incorporate plated versions of the same models. Penstand, cigarette boxes, and ash trays have previously been available, but the latest, a stainless steel crescent-shaped tray, is probably the smartest of the lot. It can be used as an ash tray or as a receptacle for things like paper clips or pins. There is a choice of four models—Daimler, Renault, Mercedes, or Bentley—the car itself being smartly plated with a silver finish. Price is 19s 11d and the tray comes in a smart pack, making it an ideal gift for a car enthusiast.

Latest Lesney Matchbox releases are a Mercedes forward control truck and a matching dropside trailer, each available as a separate item at 2s. To 1:86 scale, they will be



Revell's new 1:72 scale Macchi Saelta which we reviewed in detail last month. Price is 2s 11d.



The magnificent new Historex ammunition wagon which comes in kit form. It is to 1:30 scale.

fine for the goods yard of HO railway layouts. Detailing and finish is to the usual high Lesney standards and each has a removable plastic tilt. *C.O.E.*

FORTRESS TRIO

AURORA have released a construction kit under the title of '12 O'clock High Bomber Formation' which contains three small-scale B-17 models (about 1:200 scale we would judge), a combined base and 'target' display stand, and a transfer sheet which includes simulated flak damage as well as markings for application to the B-17s. There are also strings of bombs on the decal sheet which can be put on to the transparent plastic support beneath the aircraft, giving a 'bombs-away' effect. Young modellers will probably find this set interesting, but the serious modeller will probably be interested in the shell holes on the transfer sheet, and the colour print of B-17s attacking, which is included as a framable 'extra' in the kit. The small scale of the aircraft would also be of use for model photography. Price of the set is 24s. 6d. *C.O.E.*

HISTOREX RELEASES

FIRST of the Historex military kits promised for the winter modelling season have now come to hand from the British agents and these fully maintain the very high standard of moulding and detailing which we have noted in previous reviews. Largest item is a magnificent ammunition wagon—or *Caisson Ammunition systeme Gibeauval* to use its French designation—which carried the ammunition, round-shot, grape, and canister, for the 8 pdr gun. As the picture shows, this is a most attractive, and quite complex, horse-drawn vehicle, the body measuring about 5 inches in length. It has a hinged lid, working swivel-tree, and revolving wheels, the method of assembly exactly following that of the actual wagon. The plastic used can be joined with ordinary polystyrene cement and has a matt finish. Detailing is impeccable with perfect wood graining and rivet heads. All the tiny links used to join the shaft and swivel-trees are provided in finely moulded plastic and real chain is included for the slings. This wagon took a four-horse team, though the horses are not provided—they

Continued on page 72

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2232 Closed van	10/6
2233 Brake van	12/3
2234 Tank wagon, ESSO	19/3
2235 Tank wagon, GASOLIN	19/3
2236 Tank wagon, BP	19/3
2237 Gondola with stakes	19/3
2238 Timber wagon	19/3
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New Kits—continued

can be bought separately. Instructions are in English and there is a very clear assembly sheet. Price is 52s.

Our other sample was of a footguard of the Gendarmerie d'Elite of the 1801-06 period, which like all Historex figures is to 54 mm ('standard') size as favoured by most serious model soldier collectors. Following usual Historex standards the legs, arms, head, and torso, all come as separate pieces so that any desired position may be selected for the completed figure. There are optional badges, epaulettes, sword, and musket, so that the figure may also be completed to depict any rank of the regiment. Full assembly instructions and historical notes are given in English and there is the usual illustrated assembly sheet. The kit costs 12s 6d, postage extra. Like the ammunition waggon, the kit is available from Historex Agents, 3 Castle Street, Dover, postage extra. This firm will send the complete Historex catalogue and lists on receipt of a large SAE. *C.O.E.*

INSTANT ADHESIVE

FOR those modellers who use instant adhesive in only small quantities, a new idea which commends itself is the production of just such a product in sachet form to obviate the need for buying large tubes. As the makers point out, relatively few people have need of the quantity of adhesive in the average tube and the sachet has just

enough for the average small repair or bonding job. Known as Double Bond Epoxide, it costs 9d per sachet and full instructions for mixing and application are given on the sachet envelope. It will join most materials, including wood to plastic. Double Bond Epoxide should be available from most hardware and handyman's shops, but a list of stockists is available on request from the makers, Kenilworth Manufacturing Co, West Drayton, Middx. *C.O.E.*

ANOTHER FROM TAMIYA

TAMIYA have quickly followed up their excellent Panther kit in 1:25 scale (reviewed in our August issue) with a companion model of the Jagd Panther which appears to be based on the example preserved at the Bovington Tank Museum. This utilises precisely the same chassis and mechanical components as the Panther, complete with two motors, remote control box, real springs in the torsion bar suspension, and a track which is built up from individual shoes. The completed model is a real stunner and if anything the Jagd Panther looks even better in model form than the original Panther. A realistic cast finish and weld seams add to the overall effect. About the only possible criticism of this kit—which also applies to the original Panther—is that it stands a little high on the suspension, though this is possibly caused by stiffness in the springs and the model will probably 'settle' after a time. Our sample came from Tamiya and is not yet on sale in Britain. *C.O.E.*

Civil War—from p. 57

Infantry: Flags

Union regiments had two flags; National colours, the stars and stripes, with the regiment's name and number on the centre stripe, and Regimental colours, which were blue, with the name on a scroll beneath the eagle. Both measure 22 mm (on pole) by 23.75 mm. Confederate regiments had a Battle flag with 13 stars, and this is 15 mm square. Some also carried state or regimental colours (ie, Texans had the Bonnie Blue Flag, with a white single star on a blue ground). For colour sergeants use the running figure. Remove the rifle, and insert a length of wire through both hands to represent the pole. Copy out the desired flag pattern from the pictures or drawings and sketch it to the scale area given above. Then paint it before cutting out and cement to the pole last of all. Careful bending will give a 'fluttering' effect.

Infantry: Drummer Boys

These can be made from the Wagon Train boys. Either trim the hat to a kepi or change it for a slouch hat. Add a drum from sprue, drumsticks from pins, and paint on white carrying straps. Union drummers had light blue frogging on the jacket front. Drums were light blue or yellow with red frames and white straps.

Volkswagen—from p. 61

and if you cut the mudguards from the chassis they can be used on the VW. The rear ones have to be narrowed down and the front ones trimmed until they fit. This should present little problem when working carefully from the drawings. The three-spoke steering wheel from the Cowley is just right and can be cemented on a piece of scrap sprue for a column. I found a piece of clear plastic in my 'bits' box and used this as the windscreen, but here again if you have nothing similar you can use the one from the Cowley. Front and rear hooks could be made up by bending thin sprue, though I found some spares from tank conversions. Remaining details can be completed from bits of scrap. The MG34 machine-gun shown in the drawing is an optional fitting.

Soft skinned military vehicles of the German army and Waffen SS were generally finished in dark grey until mid-1943. After that, vehicles such as the VW were generally painted sand and this then oversprayed with brown or green to act as camouflage. In the desert it was always sand, but grey was sometimes used as an overspray. All other services normally used just the grey finish. The following numbers can be used: Army in the Desert 1942, WH 267 116; Waffen SS—Ardennes Area, 1944, SS—156 196; and finally Luftwaffe, 1945, Bad-Godesberg Area, WL 539943. This last vehicle was finished in sand, not the normal grey.

Fuselage—from p. 64

on the board with its outside facing upwards and is pushed back and forth until the mating surfaces are level. Now the holes for the windows, cockpit, etc, can be cut and interior detail added.

If the work has been carried out well the halves should fit together with a degree of accuracy which will improve with practice. They can now be cemented together just like a plastic kit.

Another way of building plastic fuselages is to use styrene sheet and balsa. Firstly a frame of 1/16 inch square balsa strip is built, allowing for the thickness of plastic used to face it, then it is left to dry out and finally clad with 30 thou plastic card. The main precaution is to ensure that the frame is perfectly true and once this has been mastered there should be no difficulty in producing fuselages this way. This method, however, is only applicable to machines such as the HP 0/400 and the Gotha G types.

For smaller fuselages such as the Morane Saulnier L a frameless styrene fuselage can be built up face by face; this will merely need stiffening with scrap balsa wood.

Lest these ideas sound irksome, let me assure doubters that they are practical. The picture shows my Vernon model on its way to completion and I must say that the hollow fuselage is well worth all the effort that goes into carving the moulds.

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RL46 G3M1 Nell Torp. Bomber	1/72	19/11

Tamiya

RL26 Ki-44 Shoki (Tojo)	1/72	4/11
RL35 C6N1 Myrt (Saiun)	1/48	19/11

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NEW BOOKS

REVIEWED FOR MODELLERS

Glorious sail

THE GREAT AGE OF SAIL. Published by Edita SA, Lausanne, and distributed in Great Britain by Patrick Stephens Ltd, Brooks House, Upper Thames Street, London EC4. Price £10 10s. Pre-publication price (prior to October 2, 1967), £9.

IT is no exaggeration to say that this is the most lavish and luxurious book we've ever seen—and also it's one of the biggest. All of which explains the high price of *The Great Age of Sail*, an enormous volume which examines the development of the sailing ship in minute and authoritative detail over five centuries, starting with the *Santa Maria* and ending with the giant five-masted *Preussen*, biggest and greatest of the famous 'Flying P' Line of Hamburg whose other famous square-riggers included *Pamir* and *Passat*. No less than twelve authors collaborated on the book which is profusely illustrated with hand-mounted colour plates, photographs, engravings, drawings, and 31 pages of scale plans and rigging charts. There are 272 pages altogether. Ships covered in separate monographs within the book include *USS Constitution*, *HMS Victory*, *The Challenge*, *La Belle Poule*, *Vasa*, and *Preussen* plus several others, while other chapters cover every aspect of sailing ships from navigation to life afloat. This is a treasure chest for ship modellers and ship lovers and offers more than most people would learn about sailing ships in a lifetime.

A reduced pre-publication price gives a substantial saving on orders placed either direct or through a bookseller prior to October 2. Overseas readers may like to know that the Swiss publishers also offer an edition with French text throughout.

Top link man

BILL HOOLE — ENGINEMAN EXTRAORDINARY, by P. W. B. Semmens. Published by Ian Allan Ltd, Terminal House, Shepperton, Middx. Price 45s.

BILL HOOLE'S railway career began at the age of 13 as a dock messenger on the Midland Railway in Liverpool. Fascinated by steam locomotives he transferred to the Great Central Railway in 1912 to begin as a cleaner the long and slow progression towards firing and driving locomotives. By the nineteen-fifties he was a Top Link driver at Kings Cross shed. At this time the A4's were in fine condition having overcome their earlier trouble with hot middle ends. War-time decline in track maintenance was largely overcome and the stage was set for some brilliant high speed running.

Bill's philosophy of getting to the other end of the journey as quickly as possible brought about some startling performances as no less than 79 runs published in books and magazines will testify. These are listed in a very useful appendix. The zenith was reached in 1959 when Bill had to be restrained to hold back *Sir Nigel Gresley* at 112 mph on the Stephenson Locomotive Society's Golden Jubilee Special down Stoke Bank. He was all set to beat *Mallard's* 126 mph and could easily have done so had there not been an overall

110 mph maximum limit set by the authorities.

The author has not spared Bill's blushes as some of his misdemeanours are laid bare. Apparently his obviously likeable personality enabled him to get away with things every time. It also enabled him to make so many friends, both individually and in association with the various railway enthusiast societies. This led to his joining the Festiniog Railway as a driver when he retired from BR service in July 1959, and the concluding chapter describes these events.

Aircraft in colour

CIVIL AIRLINERS by Kenneth Munson. Published by Blandford Press, 167 High Holborn, London, WC1. Price 16s.

THIS book and a companion volume entitled *Private Aircraft since 1946* (also 16s) continue the series published by Blandford in 1966, in which a three-view colour illustration of a subject aircraft is associated with a short description of its history and general details.

Since the earlier publications the author, Kenneth Munson, has given better coverage to the text matter associated with the aircraft and these volumes have to some extent improved on the colour reproduction. In the two earlier books on military fighters and bombers some of the drawings left rather a lot to be desired. In the two just released the standard has improved considerably.

The modeller has been the obvious target for the author and in this respect he has achieved what he set out to do. Colours, particularly on civil aircraft, can be of great interest as they vary considerably. From the multi-coloured BAC-111s and Boeing 720s of Braniff to the sedate silver of Aeroflot there are any number of variations on similar types of aircraft. The light, training and executive aircraft also add a lot to the colour of an airfield and make ideal subjects for the ingenious artist/model maker to reproduce.

Dealing with weapons

SWORD, LANCE, AND BAYONET, by Charles Ffoulkes and E. C. Hopkinson. Published by the Arms and Armour Press. Price 37s 6d.

WEAPONS AND TACTICS, by Jac Weller. Published by Nicholas Vane. Price 35s.

WEAPONS OF WAR, by P. E. Cleator. Published by Nicholas Vane. Price 42s.

All obtainable from Ken Trotman (Arms Books), 3 Ash Close, Naphill, High Wycombe, Bucks. Postage extra.

FIRST of these three books is famous as one of the standard works on its subject. It reappears again thirty years after its first publication and is an excellently written, profusely illustrated volume which deals with swords, lances, and bayonets in great detail and has an appendix for good measure on rifles, muskets, and carbines. Literally all that anyone would want to know on the subject is here, and the many pictures and drawings should enable the enthusiast to identify pretty well any sword that has ever seen military use with British forces. In fact, until we read this book we didn't appreciate what a vast subject it was.

Weapons and Tactics is a real bargain at its price and must have more facts and pictures per shilling than any other book we've reviewed this year. The author is an American arms expert and sets out to trace the development of tactics from 1066 to the present day—which he does very concisely with numerous sketch maps and pictures. The greater part of the book deals with this century, however, with the two world wars and Korea most prominent, naturally. Every important nation is covered by a chapter—including all the NATO armies, Russia, China, Germany, USA, and Britain

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—and a tremendous amount of information is packed in including infantry organisation and development and all the weapons of every period. So if you want to know how a US Marine or a German platoon was organised in 1945—or 1966—and what weapons it used, this is the book for you. Highly recommended. *Weapons of War* spreads its net more widely, from the Stone Age to the Missile Age, in fact, and is thus less detailed but all-embracing. The modeller or wargamer won't find so much in this book that he couldn't find in greater detail elsewhere, but it is quite a good buy for anyone who just wants the background to weapon development and its relationship to tactics and strategy.

Wartime merchantmen

EMPIRE SHIPS OF WORLD WAR 2, price 25s.

WARTIME STANDARD SHIPS, price 21s.

Both by W. H. Mitchell and L. A. Sawyer. Published by Sea Breezes, 17 James Street, Liverpool 2.

SEVERAL publishers over the years have brought out useful reference books dealing with the warships used by the combatant nations in the second world war, but nobody—so far as we know—has previously tackled the more formidable task of sorting out the many and varied classes of merchant ships which were either requisitioned or specially built to replace tonnage lost by U-Boat attacks. These two new books fill the gap handsomely as far as British ships are concerned and they will be essential additions to the libraries of shipping enthusiasts.

Both books are nicely produced in an easy-to-follow fashion and a standardised format is adopted which gives an introductory note to each class covered, a scale line drawing in most cases, names, tonnage, builders, main dimensions, and the eventual fate of each ship. As its name implies, the first book deals with the merchant ships built in British yards, 1939-45, which were given 'Empire' names. These ranged from coastal lighters and tiny Clyde puffers to standardised designs of tramp steamers and merchant aircraft carriers. In addition, hundreds of other ships were requisitioned, captured, or taken over, and incorporated into the British merchant fleet. Some of these did normal freighting while others performed roles as troopships, convoy rescue ships, and landing ships, among other functions. The second book deals with the 'Oceans', 'Parks' and 'Forts' which were Canadian-built counterparts of the American 'Liberty' ships, but other vessels like tugs are included. Both books have numerous pictures and good indices.

All about space

MANNED SPACECRAFT, by Kenneth Gatland. Published by Blandford Press, 167 High Holborn, London, WC1. Price 18s.

IT is just ten years this October since the first firing of an earth satellite by the Russians. Ten short years in which man has progressed from the most elementary Sputnik type of spaceshot to the complicated docking of two vehicles in orbit and the forthcoming Apollo test programme of the United States which will place a man on the moon.

The first manned spacecraft was launched in April, 1961, by the Russians, followed shortly afterwards by the first American to be launched from Cape Kennedy. Such is the rate of progress in space technology now that every month shows some significant advance in knowledge.

Kenneth Gatland, who is one of Britain's most prominent authorities of space exploration and vice-president of the British Interplanetary Society, has written a book which amply describes these almost amazing developments. He

has created in reasonably simple English a history of the first ten years of space travel and the events leading up to the first manned firings. He has also given the reader a glimpse into future projects and speculated on what is to come in the next ten years.

Air aces and aircraft

THE ALLIED ACES OF WORLD WAR 2, by W. N. Hess. Published by Arco Publishing Co Inc, 219 Park Avenue South, New York, NY 10003. Available from W. E. Hersant Ltd, 228 Archway Road, London, N1. Price 23s 6d.

THIS book will be of undoubted interest to World War 2 historians, but it throws very little extra light on what is already known about the aces of that time. What it does do, however, is draw all this information into one catalogue, and combined with an easy to read style provides a reflection on a period 20 years ago which is now becoming legend.

Each country ranging from Belgium to Russia on the Allied side has its own chapter. All of the aces, that is those fighter pilots scoring more than five victories are listed, and in most cases an illustration and description of the individual's activities is included.

FIGHTER AIRCRAFT OF THE US AND AIRLINERS OF THE WORLD, by Terry Morgan and Len Morgan respectively. Published by Arco Publishing Co Inc, 219 Park Avenue South, New York, NY 10003. Available from W. E. Hersant Ltd, 228 Archway Road, London, N1. Price 16s 9d each.

TWO books produced on very similar lines featuring large photographs mixed with descriptive matter, American style. The descriptive matter is a little too flowery for the hard-headed aerophile on this side of the Atlantic, but the illustrations are first class. Photographs of most of the British aircraft are well known, but the rest are in the main of value, especially for seekers of detail as modelling references.

Car Conversions—from page 69

1930 French GP Bentley

All wings, lamps, spare wheel and windscreen are discarded. The car is then completed in accordance with the kit instructions after filling in all unused bracket holes. When the car was raced the tonneau cover was very spartan and the kit part should be cut right down so that the edge just clears the body sides.

Before completion a number of parts must be made up. These are rear view mirror (D), carburettor cover in gauze with narrow edging of silver paper (E), aero screen for driver (C) and a gauze screen for it which lays flat on the scuttle as shown in the drawings.

Colour of the car was dark green. On each door it carried a Union Jack 8 mm x 5 mm. These can be cut from advertisements, catalogues or can be hand-painted. I've also seen Union Jack transfers but can't recall the source. Yeoman transfers provide a wide range of sizes. Numbering can be seen from the photo and should be roughly done (I know that hurts but on the prototype they were badly painted).

The driver 'Tim' Birkin wore white trousers, blue shirt, white helmet and blue and white spotted scarf.

The next London Area IPMS meeting will be on September 29 at St Mark's Church Hall, Balderton Street, London W1.

Letters to the Editor

Letters to the Editor can only be answered in the magazine. Readers whose letters are published each receive a free Airfix plastic construction kit of their choice. We are always pleased to receive your comments and pictures, which will be considered for publication. Submitted material and pictures can only be returned if accompanied by a stamped addressed envelope, and the Editor cannot accept responsibility for safe keeping of any such contributions, neither does he necessarily agree with comments expressed by correspondents in the letters columns.

Making a start

I OFTEN wonder how people first become interested in modelling and at what age.

My own introduction to Airfix 1:72 kits is related to a lake in New Mexico, USA! And I am 34 years old.

This strange relationship began a few weeks ago when I needed the name of a lake in New Mexico for a crossword puzzle. I went to our local library, taking my small son aged 2½ years with me. In the reference section I obtained an atlas and sat down to check. Stephen, my son, promptly went to a shelf at his level and pulled out a book on Building Construction, and sat beside me where we both studied our respective books.

When I got my answer, I returned my book, but Stephen flatly refused to release 'his' book. It was not until I promised him a bigger book from the other section that he let go. He toddled off and came back with a green book clutched to his chest. Having a spare ticket handy he took 'his book' home.

When his interest waned, I picked up his book and found it was *Baron Von Richtofen's Flying Circus*. I started to read it and became enthralled in a subject I previously knew nothing about. It was fascinating reading about the planes and pilots of an era past. I eventually got more books on the same subject and became a World War I aeroplane addict.

Then, looking in our local toyshop for a car for Stephen I saw the magnetic words 'Dog Fight Double'. Out of curiosity I looked in the boxed kit—and was hooked!

Alan E. Bird, Enfield, Middx.

Steel helmets

IN the letter by M. C. Dinnage on Russian Imperial Infantry (July edition) he said that he used British 1914 Infantry caps. I have found that the British Infantry can be converted into later period troops with helmets, using part of the Russian helmets.

A number of plastic discs, 4 mm in diameter, cut from 10 thou plastic card are needed. The very top of the Russian helmets are removed and stuck on to the discs to leave a rim round the edge. The helmets can then be stuck on to the heads.

R. Fowler, Huddersfield, Yorks.

Romans—continued!

IF I may be permitted space to reply to Mr Mead, who wrote in your September issue, I would be very grateful.

The Roman uniforms varied, of course, over the years and so many conditions

of armour and weapons were possible. The differing equipments as I understand it were as follows:

In early, regal, days the Roman nobility and the king rode to war in chariots and commanded armies which fought in phalanxes, on the Greek pattern. Position on the phalanx was determined by wealth since the army was one composed of citizens and, presumably, only the richer people could afford the heavy equipment of the front-rank infantryman, which would consist of a spear (*not* a pilum), a long sword, a helmet, a cuirass, greaves and a round buckler. A second row of fighters were similarly armed, but had the semi-cylindrical shield instead of the buckler. The third row was as the second, but its members did not wear greaves, the men of the fourth rank had a dart and sling.

When, in Republican times, the Roman army became a professional body, the legionary's equipment was largely standardised, and consisted of a gladius, a short stabbing sword, a dagger, two 6½ ft long pila, a leather jerkin faced with one or other of several types of cuirass, and greaves. The shields were of the semi-cylindrical type and my source says that the crest was donned only on the eve of the battle.

Apparently, greaves were not worn by the Imperial legionaries, this privilege being reserved for officers and centurions. The latter, incidentally, had a crest running from ear to ear, and a glance at the Airfix centurion will show that he has both greaves and special crest, which leads me to believe that the Airfix soldiers are Imperial legionaries.

The sources of this information are two books, both appendages to larger works, viz. *A Companion to Roman History*, by H. Stuart Jones, and *A Companion to Latin Studies*, the section involved written by E. H. Alton, and the whole work edited by Sir John Edwin Sandys.

Finally, in answer to Mr Barton, in the July issue, and using the above sources, the auxiliary archers are Palmyrenes.

J. R. Cadle, Enfield, Middx.

Guards uniform

I WOULD like to clear up a point in an article by J. S. R. Mead in the June issue of your excellent magazine on conversions of the Airfix Guards model.

Although I am a mere beginner in making models, I am afraid that Mr Mead has made one mistake in regard to the Guardsman tunic, and that is there is no braid on the sleeves or the tunic skirt. All there is, is what is known in the brigade as piping, down the front of the tunic—a single line on the edge of the tunic—and on the sleeves there is

only a single line of piping on the edge of the cuff, the top edge that is. And all the tunics are made the same in the brigade with the exception of the buttons, on which J. S. R. Mead is correct.

As a serving member of the Brigade of Guards I only thought that this small point should be raised to help modellers in their conversions, and to save any future arguments.

L/Cpl B. Tomlinson, Grenadier Guards.

Towing shackles

ONE small but essential detail on tank models is almost always forgotten. I am referring to the tow cable shackles. The best material that I have found to produce them is 'Newey Hooks and Eyes' (the type used on dresses). They require a slight bending to bring the eyes to the right position. Also they come in various sizes, suitable for Airfix tanks.

Warren Hall, Edmonton, Canada.

Nose weight

THE answer to Keith Shortridge's plea for an idea to make his Lockheed Lightning stand on its undercarriage is to use a fishing ledger. These come in various shapes and sizes and can be obtained from any fishing shop for about 3d to 1s.

Gordon Pickles, Preston, Lancs.

Scale round-shot

READERS may be interested in a cheap way of obtaining round-shot for their Crimean guns. This can easily be represented by using the small ball-bearings used in a bicycle's steering, packets of which are sold in most cycle shops. These ball-bearings are roughly the correct scale for use with the Russian 24 pounder.

C. Simpson, Hull, Yorks.

German hangars

WITH reference to Mr Stranks' letter in your July issue, I would mention the following. Firstly the camouflage on Luftwaffe hangars did, as did the colourings on British hangars, vary with the locality. The best advice I can give to anyone contemplating modelling a Luftwaffe airfield is to look at as many photos of German aircraft as possible. Very often they contain in the background complete hangars or parts of them from which it is possible to deduce the colour scheme. However, for those without the time for much research, I give the following rough guide. (1) On brick-built hangars, the colour schemes would appear to be black-green over bare

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brick on permanent airfields in wooded regions; dark earth over green in arable regions. Hangars painted plain green, grey or earth all over were also fairly common, as were the unpainted brick hangars. (2) With hangars built from corrugated material the above schemes were also used, but on many of the muddy advanced airfields on which this sort of hangar was erected, a pattern of mud brown with a small green mottle over it was used. (3) Occasionally natural methods of camouflage were used. For example, vines and other climbing plants were sometimes grown on the sides of the hangar and were trained to grow over the roof. Another method was to plant shrubs thickly round the walls of the hangar and to put moss on the roof and upper walls. One ingenious airfield commandant had this last method of camouflage on his hangars and he kept the entrances of the hangars camouflaged by installing shrubs across the entrances in pots—these could easily be moved out of the way to provide access. (4) Advanced airfields often contained no hangars, and the aircraft were stored under large areas of camouflage netting, which was supported by long poles. Aircraft stored in the open, generally the fighters, were sometimes covered with leafy branches to render them less conspicuous from the air. This camouflage method was also applied to some of the aircraft stored under the nets, which were mainly bombers.

Malcolm Oliver, Ruislip, Middx.

Portraying portholes

I AM just in the process of constructing the SS *France* and have a tip which I consider worth passing on to readers.

Being a stickler for absolute detail in painting my models, I find that the tiny etched windows on the sides of the hull castings can be really improved in effect by painting the recessed levels of each with mid grey-green matt paint.

This is not as tricky a job as it sounds as the scruffy edges, when the paint has dried, are carefully rubbed over with 'Wet' paper of the finest grade obtainable. This leaves a beautifully realistic result. The same method is employed to give a really first-class impression of the raised rings on the castings of the hull to depict the port holes. This is 'Wet' papered after the final coat of black paint has been applied.

I am a very keen modeller and have built only a few Airfix ship kits owing to my fastidious nature with regard to detailing. Those I've made include *Queen Elizabeth*, *Victorious*, *Nelson*, *Cossack*, *Hotspur*, and *Daring*.

J. R. V. Bayne, Kirkcaldy.

Veteran LCM

READERS may like to know of an interesting LCM which remains in its original condition. It is used in Bantry harbour and would provide a good excuse for including an LCM in a model harbour or river. I cannot tell what the LCM is used for, but it is still painted battleship grey with a black bottom. On the bows are painted the letters 'LCM' in the same size and style as on the Airfix model although in red. Aft of this was painted '7087' in red and the same size as the preceding M. The LCM was

in a rather battered looking condition and the hull and ramp were liberally coated in rust. The only other visible difference was the wheelhouse which had much larger windows than the Airfix model.

A. E. Boyle, Belfast, N. Ireland.

Folding sides

I THINK I have found a better way to do the awkward body sides of the Sd Kfz 7/1 conversion. Not having the Fallar fencing I cut the sides and rear from sheet perspex, of more scale thickness. I then scribed the upright and horizontal and painted them in. The inner sides were covered with nylon as per the article. This is much neater, easier and quicker and, as one side is covered anyway, it is scarcely noticeable that the spacing between the uprights is, in fact, clear perspex.

J. Burrows, Southall, Middx.

Sad omission

I ENJOYED the recent issues on the Crimean War, but a sad omission was the Argyll and Sutherland Highlanders (93rd foot). These Highlanders bravely defended Balaclava from an overwhelming force of Russian cavalry. I thought readers would be interested in how I made them. For the conversion I needed Robin Hood, Guards Band and Civil War Infantry. I used the bottom half of Robin Hood, cut at the waist, which with the top half off the Civil War infantry, will suffice for the kilt. Before cutting I added the Guards Band head. Then the top half of the Civil War infantry was cemented to the bottom half of Robin Hood. Their equipment and coatee is the same as prescribed for the Guards less the tails and white collar. For the busby I added excess plastic on the right-hand side to represent ringlets and added a white plume on the left side. The kilt was dark green with a light green criss-cross pattern running through it. A black sporran was hung by a white belt with six white tassels hanging from it. White spats cover the boots. I hope this will help readers to increase their collection of soldiers.

David A. Bruckshaw, Ossett, Yorks.

Vintage toys

PROPOS Readers' Letters, August issue—your correspondent is quite right in claiming that there are in fact museums representing toys of the inter-war period—but nevertheless these museums are few and far between, in fact, as indeed the Editor admits, very few people are aware that such museums exist.

I have for long been aware of this sadly neglected state of things and for a long while have been collecting a variety of toys/models mainly representative of the post-war era but, in fact, my collection dates back to the mid-Victorian period. It is my ultimate plan to set up a mini-museum (in the not too distant future, depending entirely upon finding a suitable property) which I then intend to open to the public and to bequeath to an interested body who would be prepared to maintain it for posterity.

Should any of your readers wish to dispose of any unwanted toys/models I should be very pleased to hear from

them, but being purely a one-man financed project I can only afford modest payments and would prefer the offer of donated items (which would be recorded as such with the donor's name, etc) but in all events I am prepared to meet carriage costs.

C. A. Bell-Knight, Freshford Manor, North Wing, nr. Bath, Somerset.

Belgian Stirling

WITH reference to Mr A. Pearcy's letter in the July issue of the magazine about Stirling transports, I have in my possession a photograph of a Stirling taken, I believe, at RAF Tengah on Singapore Island, registration OO-XAK and the name 'Air Transport' on the nose which I presume is the name of the Belgian company mentioned.

R. Edwards, Chester, Cheshire.

Mirage colours

HAVING read 'The Mirage Story' in the August issue, there are a few points concerning the Mirage IIIR I would like to clarify.

It is relatively easy to convert an Airfix Mirage IIIC to the IIIR version and full instructions for this operation are included in the excellent set of decals for this aircraft, supplied by the French firm of Max-ABT.

I feel that your scale drawing of the IIIR is possibly wrong on several counts. The leading edge of wings, tailplane and air intakes is not a shade of grey, as you claim, but a lighter shade of green, a light khaki, in fact. I have also seen IIIRs with three different colours of shock cone; that is black, silver and even white on one example, in addition to the grey mentioned in the article. The tip of the rear parabrace fairing should be off-white and not silver, the nose probe is silver at the tip and the aerial fairing on the fuselage is a yellow/orange colour. An important addition are red airbrake markings to be applied to the top of the wings with the legend 'ne pas marcher' and blank to the bottom.

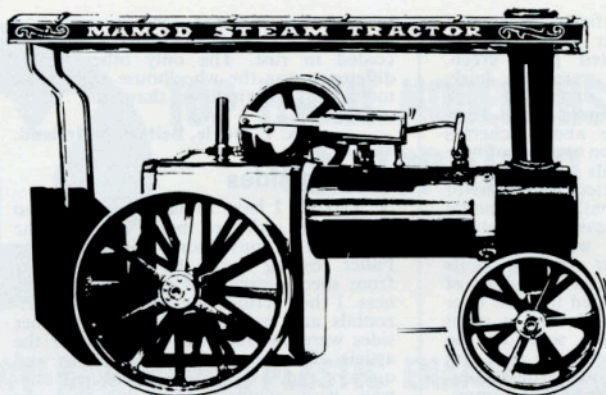
A point worth mentioning concerning the IIIC is that the underside of the aircraft features a tremendous variety of metal finishes. The rear of the fuselage just aft of the wing is, in fact, a golden tinted colour and not silver.

D. S. Ives, London, N10.

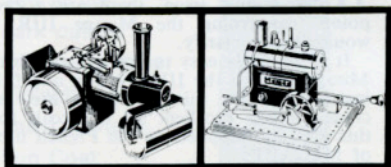
A. M. Alderson writes: *Two interesting points are raised in Mr Ives' letter. Firstly, it is not always possible to illustrate in black and white all the niceties of colour variation and secondly almost every aircraft of the same type varies to some extent.*

Mirage IIIR No 350 does, in fact, have a grey leading edge to wings, fin, air intakes and shock cone, etc, as shown. This is a slightly lighter shade of grey than the camouflage. The tip of the rear parabrace is polished silver on all the Mirages illustrated except the IIIE No 533, on which it is a greyish white. The aerial fairing on top of the fuselage on the IIIE and IIIR is pale lemon. Mr Ives is quite correct concerning the airbrake colouring and this is outlined in yellow on the IIIR. The upper surface of the flaps also carries the legend 'Ne pas marcher', being the French equivalent of our more familiar 'No step'.

Continued on next page



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Letters—continued

Of the four aircraft illustrated only the IIIE has the golden or yellow tinted rear fuselage under surface. I agree there is considerable variation in the metal finish of the Mirage and also in the tints of the di-electric panels, which I think could only be satisfactorily shown in full colour.

The four aircraft illustrated were, of course, to be seen at the 27th Air Salon at Le Bourget earlier this year.

Extravagance

I HAVE been a reader of AIRFIX magazine for some years now and I have noticed with some interest the increasing extravagance of some of your aircraft conversions. For example, in September, 1966, the Scout to Wasp conversion urged the use of Hudson tail-wheels and Jet Provost nose-wheels. More recently the 504K was converted to a 504N using an engine from a B-29. Now we have a Lancaster to York using Stormovick exhaust stubs. I would like to ask if Mr Hall buys a large kit and empties it straight into his 'spare parts' box or whether his collection includes Hudsons and Jet Provosts without undercarriages, a three engined B-29 and four Stormovicks without exhaust stubs.

E. T. Wilson, Reading, Berks.

In fact, as we usually point out, components incorporated in conversions are generally only suggestions and very often similar pieces are equally suitable from other kits.—EDITOR.

Pen-friends wanted

THE following readers have written to the Editor requesting pen-friends: J-D. Wandrich, 259 Ribnitz/Meckl, Leningrader Strasse 2, East Germany/GDR, would like to hear from anyone willing to exchange AIRFIX magazine and Airfix and Revell aircraft kits for East European modelling or aircraft magazines and kits and models. Karel Radostry, Malousova 24, Liberec 3, and Ivan Biederman, Lidicka 98, Ceske Budejovice, both of Czechoslovakia, would like to hear from anyone in Britain willing to exchange kits for East European kits. Nigel Watson, 22 St Leonard's Road, Ayr, Scotland, would like a pen-friend in USA interested in plastic and flying model aircraft and drag racing. Jiri Hornat, Praha 2, Oldrichova 7/278, Czechoslovakia, would like to hear from anyone in Britain willing to exchange aircraft kits for East European aviation magazines and plastic kits. He is 22 years old. Jhon William Wilburn, Belgrane 977, Reconquista-Santa Fe, Argentina, would like to correspond with anyone in Britain or USA interested in model aircraft. Trevor Smith, 39 Abbey Road, Selsdon, South Croydon, Surrey CR2 8NJ, wants a pen-friend overseas who speaks English and is interested in military modelling and aircraft. Age 14-16. A. Heveceral, Ulice Jana Cerstveho 50, Lipence u Prahy, Okres Praha-Zapad, Czechoslovakia, would like to hear from someone willing to exchange AIRFIX magazine monthly for Polish and Czechoslovak model magazines. Jorge Eduardo Wilburn, Mitre 466, Casilla de Cooeo 44, Reconquista-Santa Fe, Argentine, would like to hear from anyone in Britain interested in exchanging kits and models and photographs. Brian R. Williams, (12), 118 Park Avenue, Potters Bar, Herts, would like a pen-friend in Canada or USA interested in plastic modelling, slot-racing, and model boats. Keld Christensen, 21 Thorvaldsensvej, Copenhagen V, Denmark, would like a 16 year old pen-friend in Britain interested in modern military uniforms and OO/HO and 1:12 scale figures. Andreas

Goppold, 205 Hamburg 80, Wassermameg 18, West Germany, would like to hear from anyone in the 15-18 age group interested in weapons of World War 2. Alain Lachaize, Quartier Darbousson, 83 Ollioules, Var, France, would like to hear from any French-speaking person of his age (15) interested in military vehicles of World War 2 and aircraft. David McEwan, 4 Teviot Road, Hawick, Scotland, would like a pen-friend from any East European country interested in aircraft, military, and figure converting and willing to exchange kits and magazines. Age 11-13. Nigel Rodway (15), 1 Eastfield Road, Andover, Hants, would like a pen-friend overseas, aged 15, interested in warships of World War 2 and earlier. Jorma Kosonen, Kurkimaki, Kuopio, Finland, would like to hear from anyone in USA, Japan, Israel, Britain or Australia, interested in tanks, aircraft, and stamps. Age 14-16. F. Brooks, 10 Livingstone Road, London N13, is making a large diorama of the Battle of Waterloo, using converted Airfix figures and would like to hear from anyone interested in this subject who can help him with detailed information. Interested readers are asked to make contact direct with any of the above named at the addresses given.

Desert War

Military enthusiasts should not miss the important series on the war in the Western Desert, 1940-43, which the Sunday Times Magazine is featuring throughout September. Numerous articles plus maps and pictures, many in colour, cover the subject in detail. The issue of September 24 includes a special article on weapons of the desert war.

AIRFIX magazine

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WANTED

Revell B-36; Hawk Geebee, Ike, Solution; Lincoln DC-7, Constellation, Auster; plastic kits or made-up. Spring, Wellington, Lincs.

Airfix Magazines, July-October 1963; January 1964; June, July 1965; October 1965-February 1966; April, October 1966. D. J. Monteith, 123 Clifton Drive, Blackpool, Lancs.

Airfix Magazines, August 1963-September 1964 inclusive; March 1965. State price. R. Hamon, 17 Victoria Road, Guernsey.

Airfix Magazines, first—September 1966 inclusive. Offers. Conwy, Bodrhyddan, Rhuddlan, N Wales.

Unmade Frog Meteor F.8. Will pay £1. Write: A. Leader, 'Kenview', Fitzroy Park, Highgate, London, N6.

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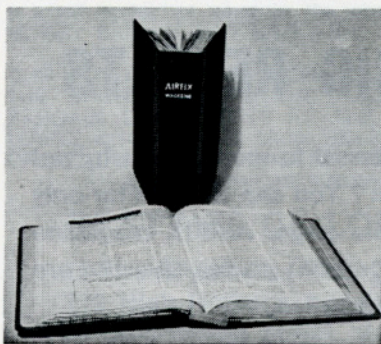
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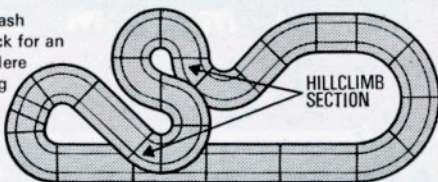
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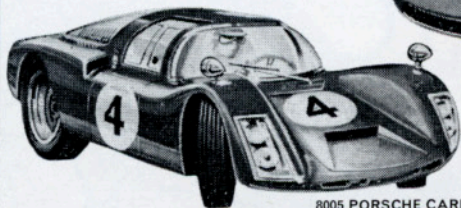
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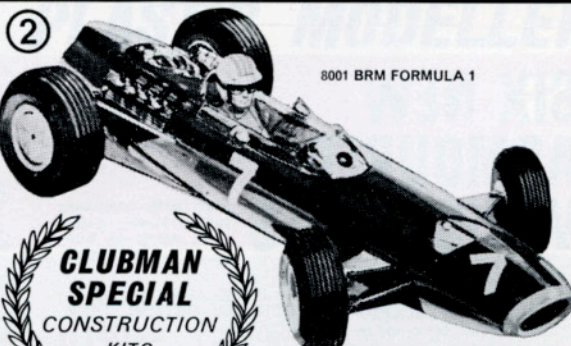
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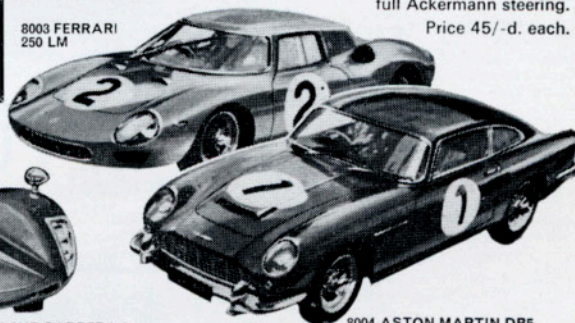
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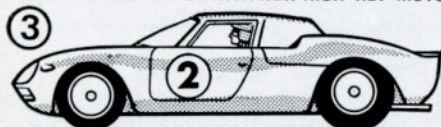


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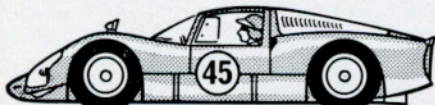


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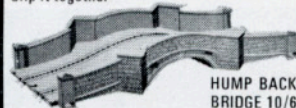
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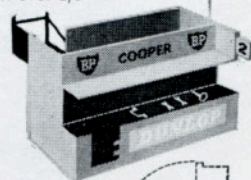
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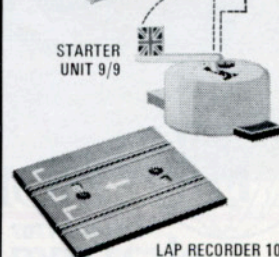


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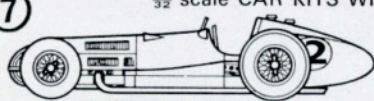


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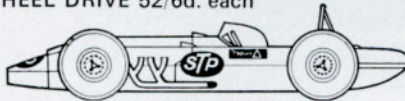


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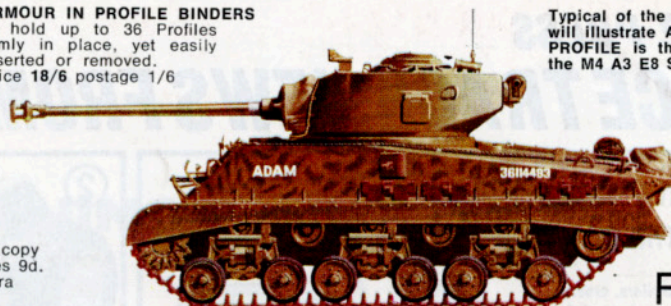
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